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Participação em concursos de empreendedorismo e os fatores de sucesso das start-ups

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Participation in entrepreneurship competitions and the success factors of start-ups

Tese apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Gestão realizada sob a orientação científica da Doutora Ana Isabel Dias Daniel, Professor Auxiliar Convidado do Departamento de Economia, Gestão, Engenharia Industrial e Turismo da Universidade de Aveiro e com coorientação científica da Mestre Mariana Topete de Oliveira Pita, Assistente Convidada do Departamento de Economia, Gestão, Engenharia Industrial e Turismo da Universidade de Aveiro

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resumo

O empreendedorismo tem vindo a crescer significativamente ao longo dos últimos anos. Paralelamente, com o objetivo de apoiar o desenvolvimento e crescimento das start-ups, também o número de competições de empreendedorismo tem aumentado. Ainda assim, apesar das diversas medidas de apoio, o número de start-ups que atinge o sucesso é reduzido.

Perante este fenómeno, foram já vários os estudos que se debruçaram sobre a análise dos fatores que contribuem para o sucesso das start-ups, mas ainda muito se desconhece sobre os fatores que mais contribuem para o sucesso destas empresas.

Esta dissertação propõe estudar o impacto das competições no sucesso das start-up e identificar os fatores de sucesso que contribuíram para o seu crescimento através de um estudo exploratório.

Através de uma abordagem qualitativa, foram analisadas 5 start-ups, todas vencedoras da competição Building Global Innovators, considerando três grupos de fatores: fundador, recursos e estratégia. No que se refere ao grupo fundador recorreu-se à análise quantitativa com recurso a métodos estatísticos descritivos. Esta combinação de métodos permitiu obter indicações relevantes sobre os fatores que mais contribuem para o sucesso das start-ups.

Os resultados sugerem que, para além dos nove fatores de sucesso inicialmente identificados a partir da revisão da literatura, o desejo de aproveitar todas as oportunidades é relevante para o sucesso das start-ups.

keywords Start-up; Start-up Competition; Success Factors; Entrepreneruship.

abstract

Entrepreneurship has been growing significative since the last years. At the same time, with the aim of supporting the developing and growth of the start-ups, the number of competitions has also been growing. Despite the several numbers of policies, the number of start-ups that success it is still small.

Faced with this phenomenon, several studies focused on the analysis of the factors that contribute to the success of the start-ups, but much of it is still unknown about the factors that contribute the most to the success of this companies.

This dissertation proposes to study the impact that the competitions have in the success of the start-up and identify the success factors that contributed to their growth, through an exploratory study.

Through a qualitative approach, it was analysed five start-ups, all of them winners of the Building Global Innovators competition, considering three group of factors: founder, strategy and resources. About the group of the founder, it was used a quantitative analysis using a descriptive statistical method. This combination of methods allowed to get important indications about the factors that contribute to the start-up success.

The results suggest that, besides the nine success factors initially identified through the literature review, the desire to seize every opportunity it is relevant to the start-up success.

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INTRODUCTION

Nowadays, entrepreneurship is a hot topic, and special attention has been given to the subject mainly because it is considered critical to social and economic development. The increasing attention of researchers devoted to this topic can be observed through a search on Scopus, where the number of articles published about entrepreneurship has been growing since 1982, with an exponential growth after 2003. It went from 16 published articles in 1980 to 550 in 2003, and more than 2998 in 2016. These results reveal the importance that entrepreneurship has in the modern society.

For Shane & Venkataraman (2000), the field of entrepreneurship "*involves the study of sources of opportunities; the processes of discovery, evaluation, and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them*" (p. 218). In the same line, Ahmad & Seymour (2008) associated entrepreneurship with entrepreneurial activity as "*the enterprising human action in pursuit of the generation of value, through the creation or expansion of economic activity, by identifying and exploiting new products, processes or markets*" (p.14). Several authors have distinguished different types of entrepreneurship, such as the international entrepreneurship, that can be defined as: "*(…) the discovery, enactment, evaluation, and exploitation of opportunities—across national borders—to create future goods and services*" (Oviatt & McDougall, 2005, p. 540). Also, social entrepreneurship that is understood as the process to develop and implement sustainable solutions to neglected problems of society, and the technology entrepreneurship that is distinguished from other types, such as the social entrepreneurship, by being "*related to advances in scientific and technological knowledge*" (Bailetti, 2012, p. 5).

However, when we are addressing entrepreneurship, it is unavoidable to mention the role and personal traits of entrepreneurs. There are several definitions that attempt to define entrepreneurs. Mueller & Thomas (2001) defined it as a "*self-motivated individual who takes the initiative to start and build an enterprise relying primarily on self rather than others to formulate and implement his or her goals*" (p. 55), or it can also be defined, in a more general way, as someone who "*discover and exploit new products, new processes, and new ways of organizing*" (Baum & Locke, 2004, p. 588).

According to GEM - Global Entrepreneurship Monitor (2010), in 2010 the Total Early-stage Entrepreneurial Activity in Portugal was of 4,5% which means that 4,5 in each 100 individuals were early stage entrepreneurs. In 2014, this value doubled, reaching the 10%, but since then it has decayed, reaching the value of 8,2% in 2016 (GEM, 2017). Also, in 2016 the principal ecosystems in Portugal were in Lisbon (32,8%) followed by Braga, and in 3rd Oporto, with 19,8% of the business being in the IT and software development category (Duarte & Grilo, 2016). According to Informa D&B (2016), in 2012 the number of start-ups created was of 29 216, and since then it has been growing, reaching a value of 35 555 in 2015. Despite this, only 67% of these start-ups survived the first year, 59% the second, and 41% survived five years. The start-ups represent a value of 7,1% in Portugal's total business (Informa D&B, 2016), so it is important to know how to create and promote

its development. Therefore, the study about the success factors of the start-ups is crucial to foster the economic development.

Nowadays, Portugal has one of the most attractive ecosystems for start-ups because of investments made by the government in infrastructures and education (StartUP Portugal, n.d.), for example, it even hosted one of the largest tech events in 2016, the Web Summit. Portugal also the country where some iconic start-ups have been created, such as Uniplaces, TalkDesk, Veniam, and Science4you. These are some examples of what is done in Portugal. Despite this, and all of the efforts made by the government, Portugal is still a small country when compared with others, with a population of, approximately, 10 300 000(PORDATA, n.d.), and consequently has a limited market. Due to this, the start-ups need to go across borders and explore international markets to leverage its success rate. Also, the global market is extremely competitive, so these start-ups will need the maximum support to develop and succeed, either by funding, training or even mentoring. Despite this, only 28,6% of start-ups do businesses at European level and 20,6% at worldwide (ESM, 2016).

Despite the increasing importance that entrepreneurship has gained through the years, and the number of studies that aimed to understand what makes the start-ups succeed, there's a gap in the literature regarding the studies that directly relates the participation in start-up competitions with the start-up's success. In other words, it is still unclear how the impact of entrepreneurship competitions (idea competitions, business plan/business model competitions) affects the success of start-ups. Thus, the present study aims at fulfilling this gap by providing insights regarding the following research question:

"How does start-up competitions influence the success of start-ups?"

Given the research question, this study aims at, on one hand, identifying the different factors that influence the success of start-ups which are described in the literature, and to understand the influence of start-ups competitions in start-ups' success factors. As an output of this study, several recommendations can be outlined at the policy level, to better support the creation and development of start-up companies in different economic sectors.

This dissertation is divided into five chapters. The first chapter provides a literature review and presents a broader overview of the different concepts discussed, such as start-up, and success, as well as which factors are critical to the start-up success. Also, an introduction of start-up competitions is provided.

The second chapter is dedicated to the methodology and includes the objectives of the study, the research questions, the sample, and approach adopted.

The third chapter presents the start-up competition that will be studied, as well as the case studies of the interviewed start-ups. The fourth chapter presents the results and discussion of this study for each one of the previously identified variables.

Finally, chapter five presents the conclusion of the study, limitations of the research and suggestions for future research.

1. LITERATURE REVIEW

The success of start-ups is a topic that has gained increased interest in the academic community. Although the existence of a considerable number of studies, there is no consensus in the literature about what are the factors that contribute more to the success of a start-up, as well as the best approach to assess the impact of those different factors. Nevertheless, there are factors pointed out as more relevant, despite the fact it is always necessary to consider the uniqueness of each start-up and their process/context.

1.1 START-UP STAGE

There are several definitions for start-ups, and these may change according to the approach used. For the same expression, different meanings are used depending on the authors' understanding (e.g. age, profitability, growth metrics) (Silva, 2016). In the following table (see Table 1) is presented some of the definitions found in the literature.

Table 1 – Start-up definitions found in the literature.

Author	Definition
Ries, 2011, p. 8	*"Start-up is a human institution designed to deliver a new product or service under conditions of extreme uncertainty."*
Blank & Dorf, 2012, p. XVII	*"Start-up is a temporary organization formed to search for a repeatable and scalable business model."*
Čalopa, Horvat, & Lalic, 2014, p. 19	*"Start-up companies are newly founded companies or entrepreneurial ventures that are in the phase of development and market research."*
Passaro, Quinto, Thomas, & Passaro, 2017, p. 427	*"Start-ups are usually characterised by elevated levels of innovativeness, rapid growth, knowledge-intensive activities and new technologies."*

Despite those definitions, there is also a misunderstanding between start-ups and spin-offs, and similarly, there is no consensual definition for a spin-off. According to Shane (2004), a university spin-off can be defined as "*a new company founded to exploit a piece of intellectual property created in an academic institution*" (p.4) or as "*companies founded by university teachers, researchers, or students and graduates in order to commercially exploit the result of the research in which they might*

have been involved at the university" (Bellini et al., n.d., p. 2). This type of companies are rare, but really important for local economic development because normally they are extremely successful and excellent sources of high technology products (Shane, 2004). In this study, start-up and spin-offs are considered as similar. So, as a working definition in this study, a start-up is considered a newly founded company, in a development phase and market research, that is created to deliver a product with high levels of innovativeness that may or may not be connected to an academic institution through University's intellectual property means.

When studying start-ups, it is also important to understand its stage of development. Thus, in this study, it will be considered *Marmer Stages* of start-up development which are: (1) Discovery; (2) Validation; (3) Efficiency; (4) Scale; (5) Profit Maximisation and (6) Renewal or Decline (Marmer et al. (2012). As it is represented in the following figure (see figure 1), it is expected that the development level grows through each one of the phases.

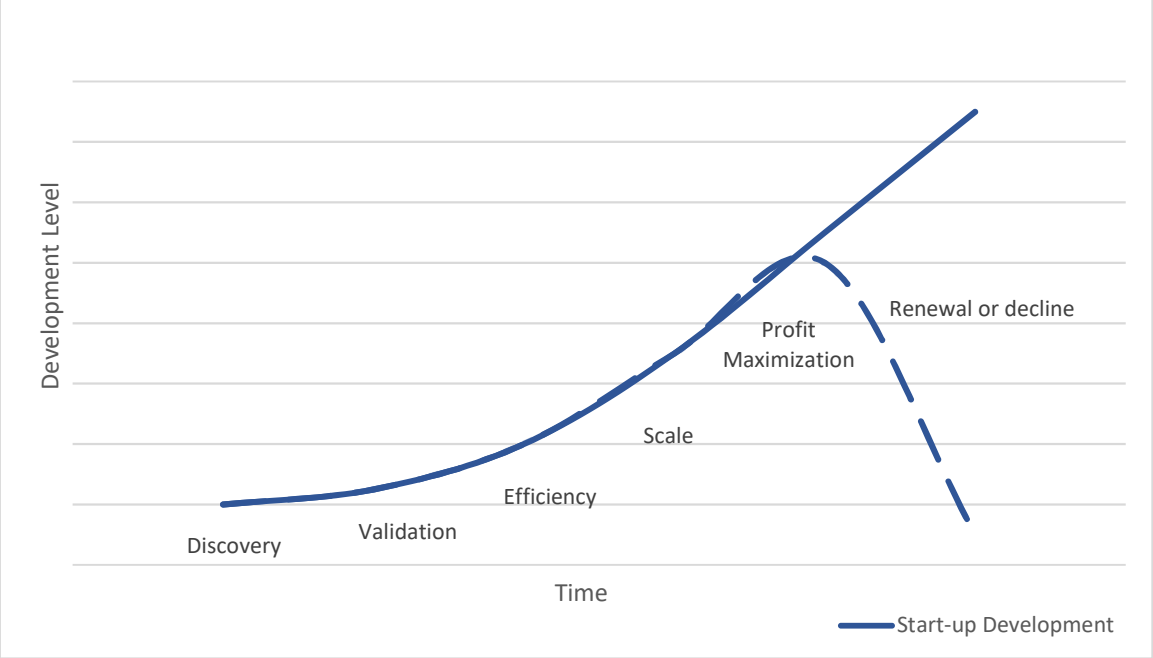

Figure 1 – Start-up development level (adapted from Max Marmer et al., 2012)

In the first stage – discovery - the start-up is trying to understand if it is worth to solve the problem found in the market and if there is anyone that may be interested in using this solution. This stage can last from 5 to 7 months.

The second stage – validation - consists of getting the actual confirmation if someone is going to use this solution or not, and it can last between 3 to 5 months. When the company is able to confirm that someone is going to buy their solution, they pass to the third phase – efficiency - that is when they develop their business plan and try to increase the number of users. This phase can last from 7

to 9 months. Next, it will be the fourth phase - scale - where the start-ups will start to grow and expand, and it can last between 7 to 9 months. Finally, there will be the fifth phase - profit maximisation - where, as the name indicates, the start-up will try to maximise their profits and then the sixth phase Renewal or Decline (Čalopa et al., 2014; Marmer et al., 2012).

Each stage will have different challenges, but each one is essential for the growth of the start-up. In the beginning, the business resources, the founder's ability to raise cash and fulfil his business and personal goals are critical. Over time, the quality of the people hired and the strategic planning will become more relevant to the success of the start-up. The important conclusion to take out of this is that each factor will be important in specific stages of the start-up's development (Churchill & Lewis, 1983). Also, it is expected that the amount of funding raised, the number of employees and number customers grow in the first four stages (Marmer et al., 2012).

With this classification, it will be possible to assess the evolution of the start-up during and after the competiton and to identify the stage that start-ups are when participating in this type of competitions.

1.2 ENTREPRENEURSHIP COMPETITIONS

Together with the increase of entrepreneurial activity, more and more entrepreneurship competitions are appearing every year (Schwartz, Goethner, Michelsen, & Waldmann, 2013). Despite this, the literature on this subject is still very limited (Passaro et al., 2017; Schwartz et al., 2013). There are several entrepreneurship competitions such as idea competitions, business model competitions and start-up competitions. The present study will address start-up competitions (SUC). Although the existence of several definitions, a start-up competition can be defined as: "*a selective instrument of entrepreneurship policy aiming at screening more innovative and feasible business ideas and, indirectly, at encouraging the starting-up of new businesses by relying on soft policy measures rather than on financial, monetary or fiscal rewards (hard measures)*" (Passaro et al., 2017, p. 428).

According to Schwartz et al. 2013, the objectives of a start-up competition (SUC) are the following: *"Increase the quantity of entrepreneurial activity by shaping an individual's decision to become a nascent entrepreneur; Increase the quality of entrepreneurship; Increase the probability of successful development of the prospective start-ups, through the development of entrepreneurial skills" (p. 1578).*

Passaro et al. (2017) argue that SUC promoted by private organisations will have a market-oriented approach, while the ones promoted by public organisations are more oriented to promote education and skills development. A start-up competition can offer different benefits to participants, such as: "*coaching packages and mixed prizes, tutoring and training activities, specialisation, judging committees with entrepreneurship experts*" (Passaro et al., 2017, p. 440). Although the existence of different program structures, Passaro et al. (2017) indicated 3 phases that are usually common to all start-up competitions:

- 1st phase: "*start-up competitions are proposed by an organising committee that encourages a competition among business ideas";*
- 2nd phase: "*The submission of business ideas, that is the proposal by a team of proponents of an innovative product/service that could be commercially successful, is a necessary requisite to participate";*
- 3rd phase: "*The submitted business ideas are initially screened through a planned selective grid, and only the best proposals gain access to the following steps during which participants have to develop a business model and/or a detailed business plan. Business models and/or business plans also go through an evaluation process consisting of one or more stages; only the best proposals are selected as finalists/winners of the competition by a judging committee." (p.428).*

The participation in such initiatives could have an impact on several aspects of start-up stage development. For instance, as mentioned by Parente, Feola, Cucino, & Catolino (2015) "*the main problem for a spin-off, and in more general terms for a start-up, is that of acquiring a favourable reputation among key stakeholders, who will then decide to get in touch and exchange know-how and invest resources as they believe both the promoters reliable and the initiative and the business idea sufficiently credible*" (Parente et al., 2015, p. 556). This reputation may influence the survival rate of the start-up (Rao, 1994). In early stages of a start-up development, and since the market awareness of the new company is scarce, its visibility and reputation will depend mostly on the visibility and reputation of its founder (Parente et al., 2015). Thus, being a winner in an entrepreneurship competition will give those companies credibility, and consequently will contribute to building the reputation needed to survive (Rao, 1994), as well as the visibility granted by the media could be of high importance to companies' development (Parente et al., 2015).

Nevertheless, Passaro et al. (2017) mentioned that companies that participate in entrepreneurship competitions have a lower probability of failure, since competition's process already filtered the best ideas, and discourage the less promisor business ideas. Thomas, Gudmundson, Turner, & Suhr (2014) in a study about business plan competitions mentioned that these type of contests can be an opportunity to gain networking, although this is not the main reason for participating, and that this competition will have impact on the entrepreneur's business model mainly in the areas of market strategy and managing.

In some cases, an entrepreneurship competition can be organized as an acceleration program, which aims at "*(…) accelerate successful venture creation by providing specific incubation services, focused on education and mentoring, during an intensive program of limited duration*"(Pauwels, Clarysse, Wright, & Van Hove, 2016, p. 13). These type of competitions has its own characteristics and differ regarding program packages, strategic focus, selection process, funding structure and alumni relations (Pauwels et al., 2016). They will offer unique opportunities to gain more knowledge, and also gain social capital (Audretsch, Aldridge, & Sanders, 2011). Because of the importance that accelerators have for the developing of start-ups, and to develop entrepreneurship, many universities want to create their own, but this may not result because it requires a high level of legitimacy for the program to succeed (Pauwels et al., 2016).

1.3 START-UP SUCCESS FACTORS

Defining success can be difficult, especially in the early years of a start-up since those companies may not have "*any profit and neither standardised accounting measures nor indicators of performance*" (Pérez & Batista-Canino, 2009, p. 992). Thus, the achievement of success will be mostly influenced by the perception the founders have about it. Thus, "*success would be easier to achieve if the owners had a broader and more diverse vision of the success of their business* (evaluating it from different perspectives)" (Pérez & Batista-Canino, 2009, p. 1003).

According to the literature, there are several definitions of start-up success (see table 2).

Table 2 - Success definitions

Author	Definition
Kakati, 2003, p. 448	"*Achievement of something desired, planned or attempted.*"
Kessler, 2007, p. 338	*"Full-time start-up with no negative change in the number of employees in the period between business establishment and the survey."*
D. Silva, 2016, p. 6	*"Startup which operates four or more years whether or not there was a change of ownership."*

In the frame of the present study, it is proposed that success will depend on the objectives that each entrepreneur has for the start-up, and also on the evolvement that the start-up had since the participation in the competition until the beginning of the current year (2017).

There are several studies aimed at identifying the most relevant success factors of start-ups. Kakati (2003) conducted a study about the success factors of the high-tech new ventures, and the following criteria were identified: entrepreneur's quality, resource-based capability, competitive strategy, product characteristics, market characteristics and financial criteria. The author found out that the entrepreneur quality, resource-based capability, and competitive strategy are the most important factors to the new-venture success. To Kakati (2003) the entrepreneur's quality has the more critical importance since it is him that will gather resources and develop strategies. In turn, Chorev & Anderson (2006) concluded that the commitment of the core team, their expertise along with the

business idea itself and strategy in general, including marketing, were the most important aspects for the success of Israeli high-tech start-ups. The authors also stated that the networking, type of funding, the economy, the existence of a complete product, company's organisation, the general environment, and politics were the less critical factors for the start-up success. In the same line, Burton & Beckman (2010) in a study conducted by the CAHRS (Center for Advanced Human Resource Studies) argue that the founder's personality and experience, in combination with the organisational structure, are important aspects of the success of start-up and influence the prediction of the future of that start-up. Thus, it is the founders' career experience will have a major impact in how the company will grow.

Silva (2016) studied the specific factors that influence the Portuguese start-ups and chose the following explanatory variables to conduct the study: (1) Characteristics of the founder (industry experience, management experience, management experience, education, age of owner, parents owned a business, marketing skills); (2) Accessibility to capital; (3) Characteristics of the start-ups (record keeping and financial control, planning, professional advisors, staffing, product or service timing, partners); (4) External markets. The author took similar conclusions to Kakati (2003) and Burton & Beckman (2010), where founders' characteristics and the external factors were the more significant variable when studying the success factors of start-ups.

Lussier & Corman (1996) assessed business success vs. failure model for companies with 0-10 employees and concluded that the use of professional advisors, planning, and education had the most influence on the success of a start-up. Additionally, to those variables, the author also assessed minority business ownership, staffing, parents owned a business, record keeping and financial control, capital, industry experience, economic timing.

Additionally, Song, Podoynitsyna, Bij, & Halman (2008) not only reached the same conclusion, that some of the founders' traits are relevant to the success of the start-ups, but also: supply chain integration; market scope; firm age; size of founding team; financial resources; and existence of patent protection, have an important role. Kessler (2007) concluded that there is a cultural embeddedness of entrepreneurship by studying the different success factors of new businesses in Austria and the Czech Republic, which have different business environments. To conduct this study, the author concluded that the success factors in an early stage of development are a combination of (1) Founder's characteristics; (2) Start-up environment; (3) Start-up resources; (4) Development Process; (5) Decision Making in the Start-up process. As a conclusion, it was also observed that in the Czech Republic the variables related to the internal resources, like the founder's characteristics and resources, and also with the process aspects had more importance, while in Austria this variable did not show any significant predictor of success. In this last case, the environmental aspects, like network and role models were the most important factors. In table 3 it is presented a summary of the main success factors found in the literature.

Table 3 – Success Factors.

Reference	Success Factors	Analysis Unit	Methodology
Lussier & Corman, 1996	Professional advisors, planning, education	Companies with 0-10 employees	Stepwise discriminant analysis
Kakati, 2003	Entrepreneur's quality; Resource-based capability Competitive strategy	High-Tech New Ventures	Quantitative
Chorev & Anderson, 2006	Core team expertise Idea Strategies	Managers and investors	Quantitative and Qualitative
Kessler, 2007	Decision making in the start-up process Start-up environment; Founder's characteristics Start-up resources; Development Process;	Start-ups in early development stages in Austria and in the Czech Republic.	Quantitative
Song et al., 2008	Founders' characteristics Supply chain integration; Market scope; Firm age; Size of founding team; Financial resources; Existence of patent protection	New technology ventures	Quantitative
Burton & Beckman, 2010	Founder's experience; Organizational Structure	Executives from entrepreneurial high-tech firms	Quantitative
Silva, 2016	Characteristics of the founder; Accessibility to capital; Characteristics of the start-ups; External markets	Portuguese Start-ups	Quantitative

Silva (2013) used a different and instead of studying the success factors of the start-ups, like previous studies, did the opposite. In this case, it was investigated the failure factors that affect start-ups, and the following were considered the most significant: (1) Lack of skills and competencies; (2) Lack of networking; (3) Product level issues; (4) Market level issues; (5) Strategy level issues; (6) Operations level issues; (7) Context level issues and (8) Other non-controllable variables. Also, one of the main conclusions was that these variables cannot be analysed individually, and have to be considered as a whole. For example, the lack of personal skills can affect the social relationships of the entrepreneur's network, or the lack of planning can influence, negatively, market uncertainty Silva (2013).

In sum, from the literature review about start-ups' success factors it is possible to cluster the different factors into three major groups:

1. The first group is related to the founders, and it will be centred in the founder's characteristics, experience, education, as well as the team characteristics. This group of factors were most addressed in the literature (Burton & Beckman, 2010; Chorev & Anderson, 2006; Kakati, 2003; Lussier & Corman, 1996; D. Silva, 2016; Song et al., 2008);
2. The second group is related to strategy. In this case, strategy, the business model and the business plan are important for start-ups, since it established the different options related to company´s development and growth (Chorev & Anderson, 2006; Kakati, 2003);
3. The third group includes the different resources needed for companies' development: financial capital, networking, professional advisors and patent protection (Kakati, 2003; Kessler, 2007; D. Silva, 2016; Song et al., 2008).

1.3.1 FOUNDER

As seen before, several authors through the years agree that the founder's traits play an important role in the success of a start-up. However, there's some discussion related to which characteristics are more critical or relevant.

Basic education and young age has a negative impact on the success of the start-up (Silva, 2016), as well as the lack of passion, and low-risk intolerance (Selig, 2014). As mentioned by Kakati (2003): "*Young, innovative entrepreneurs may have bright ideas, but due to lack of hard work, courage and sustained effort, they may fail to implement their ideas successfully*" (p. 455). About the personality traits, Selig (2014) identify the following ones as the most important for the start-up's success: strong work ethic, being highly motivated, having passion and having a winning attitude. This can be related to McClelland Three Needs Theory, which attempts to explain how the 'needs for achievement', 'power', and 'affiliation' affect the actions of people from a managerial perspective (Fisher, 2017). Despite this, in studies related to entrepreneurship and the success of start-ups, the trait that is more often assessed is the 'need for achievement' (Kessler, 2007; Silva, 2016). Other traits that often appear in this type of studies are the risk propensity and the locus of control (Kessler, 2007). Additionally, several authors have also highlighted 'entrepreneurial passion' and 'resilience' as

important personality traits of the entrepreneur (Bullough & Renko, 2013; Cardon, Gregoire, Stevens, & Patel, 2013; Fisher, 2011).

FOUNDER'S TRAITS: NEED FOR ACHIEVEMENT

The 'need for achievement' trait has received much attention in the field of entrepreneurship research (Shane, Locke, & Collins, 2003) and it *"implies that one chooses tasks of moderate difficulty, accepts responsibility for results, and seeks feedback on action outcomes. It is important for entrepreneurship because entrepreneurs need to be interested in the tasks that they are doing to perform well"* (Rauch & Frese, 2007, p. 358). This trait is often positively related to the growth, and success of companies (Begley & Boyd, 1987).

A person with a higher 'need for achievement' normally is"(…) highly *motivated, energetic, and has a capacity for hard work. They are busy, driven, dynamic and highly committed to getting things done. Their high motivation levels are characterised by a high need for achievement, manifesting as the desire to lead*" (Caird, 2013, p. 5).

Lee & Tsang (2001) have studied Singapore's start-ups and concluded that the impact of the 'need for achievement' in the start-up performance is substantially smaller than the impact that the founder's experience has on it, which could be due to the fear of failure that is strongly presented in Singapore's society. Despite this, the author has concluded that the need for achievement is the personality trait that has more influence in the venture growth.

Likewise, Kessler (2007) concluded that the personality trait 'need for achievement' in the case of Czech Republic is an important factor for the success of start-ups, while in Austria it was not observed any impact. Despite this, the author stated that "*classic personality dimensions are of essential importance in explaining the decision to start a business in the first place, but bear only little significance of the successful realisation of a start-up (…)*" (p.395). Also, Collins, Hanges, & Locke (2004) argued that the achievement motivation has a significant influence on both the choice of opting for an entrepreneurial career, as well as in the entrepreneurial performance itself.

FOUNDER'S TRAITS: LOCUS OF CONTROL

This trait, similarly to the 'need for achievement', is often related in the literature to entrepreneur's orientation and success, as well as, the start-up success (Hansemark, 2003; Mueller & Thomas, 2001; Shane et al., 2003). Although some criticism in the literature regarding personality traits, which some authors argue are acquired at birth or at an early age, and cannot be influenced by experience and education, 'locus of control', in turn, can be influenced by "*experience in the workplace, education, exposure to role models, parents and culture which shape values and beliefs*" (Mueller & Thomas, 2001).

'Locus of control' can be considered either internal or external. If an entrepreneur believes that some event happens as a matter of luck or chance, then it is considered that he has an external 'locus of control'. On the other hand, if he believes that this event happened due to his skills and capacities, therefore he made it happen, it can be considered that he has an 'internal locus of control' (Rotter, 1966).

Caird (2013) identified several qualities that a person with 'internal locus of control' detain: "(…) opportunistic, seeking and taking advantage of opportunities; self-confidence with the belief that they have control over their destiny and make their own luck, rather than being controlled by fate; Proactive, taking personal responsibility to navigate the problems that arise to achieve success on their terms; determination and express a strong-willed control over life; Self-belief, equating the results achieved with the effort made" (p. 7).

'Internal locus of control' is usually related to the entrepreneurship field. This trait is considered a pre-requisite for action to go ahead with his/her plans. Thus, the entrepreneur will only take the risk, such as the creation of a start-up, with the expectation of being rewarded for his personal effort (Mueller & Thomas, 2001). Hansemark (2003) reached the same conclusion that the 'internal locus of control' is a pre-requisite to starting a business, but only for men, which can imply that the internal dispositions to start a business are different in men and women.

Also, Lee & Tsang (2001) found out that the 'internal locus of control' has a direct impact on the venture growth, and Kessler (2007) argue that this trait had one of the highest correlation with success of the start-up in the Czech Republic sample.

Boone et al. (1996) relates the 'locus of control', specifically the 'internal locus of control', with the ability to define a successful product differentiation strategy, one of the factors that are also crucial to the start-up success. Wijbenga & van Witteloostuijn (2007) also demonstrate a positive influence of entrepreneur's 'internal locus of control' and the ability to define innovation strategies in stable industry environments, and that externally entrepreneurs tend to use more low-cost strategies in dynamic sectors. The author concludes *"that external individuals are related with conservative behaviour in risk-taking situations" (p. 580).*

FOUNDER'S TRAITS: RISK PROPENSITY

The study of 'risk propensity' is still a matter of discussion because the perception of risk can diverge from people to people. Thus, what is risky for someone may not be considered risky for another person (Shane et al., 2003). Also, 'risk perception' can evolve, since entrepreneurs can learn with their mistakes and successes (Gartner & Liao, 2012). Despite this, 'risk propensity' is still often considered when assessing the entrepreneur's personality traits (Kessler, 2007). Landqvist & Stålhandske (2010) define 'risk propensity' as: "*as an accumulative result from the risk tendencies of this person*" (p. 11).

People with entrepreneurial orientation normally have higher levels of 'risk propensity' (Landqvist & Stålhandske, 2010; Okhomina, 2010; Wooten, Timmerman, & Folger, 1999), which can be easily understood since starting a new business is related with uncertainties at different levels (Balascan, 2014), and entrepreneurship, in general, comes with a risk attached (Landqvist & Stålhandske, 2010).

Although this trait can be considered a pre-requisite to starting a company (Mueller & Thomas, 2001), Gartner & Liao (2012) didn't find any relation between 'risk propensity' and the probability of an entrepreneur starting a new business.

Regarding the start-up performance, Begley & Boyd (1987) have observed a positive relationship between Return on Assets (ROA) and a moderate founder's 'risk taking' level. According to Wooten et al. (1999), this trait is useful to predict the behaviour of the entrepreneur, that will influence the success of the start-up, when resources, such as the financial ones, are at stake.

FOUNDER'S TRAITS: RESILIENCE

As mentioned by Zautra, Hall, & Murray (2010), "*resilience is best defined as an outcome of successful adaptation to adversity*". (p.3) Although it is not usually addressed in studies about entrepreneurs´ personality and start-up success, several authors have highlighted a positive relationship between resilience and entrepreneurial success (Bullough & Renko, 2013; Fisher, 2011; Jensen, Trollope-Kumar, Waters, & Everson, 2008).

Ayala & Manzano (2010) argue that the entrepreneur's resilience is more important in start-up success than the 'need for achievement' and 'locus of control'. In a more recent study, the authors found out a positive relationship between this trait and the companies' growth capacity (Ayala & Manzano, 2014).

Some authors argue that resilience is developed in the childhood (R. Fisher, 2011), and others state that it can be learned (Bullough & Renko, 2013; Jensen et al., 2008). Bullough & Renko (2013) suggested that in order to develop resilience, as well as self-efficacy, the entrepreneurs should:

"1. Engage in business development training to build their belief in their entrepreneurial ability (i.e., entrepreneurial self-efficacy);

2. Seek out networking events, special lectures, and mentoring opportunities to learn by modelling others who have been resilient through challenging times;

3 Be active in their entrepreneurial pursuits, practice business acumen, and seek feedback from those who can be objective, critical, and encouraging" (p.1).

FOUNDER'S TRAITS: ENTREPRENEURIAL PASSION

Studies about entrepreneurial passion (EP) are still scarce in the literature (Rauch & Frese, 2007). EP can be defined as "*an entrepreneur's intense affective state accompanied by cognitive and behavioural manifestations of high personal value*" (Chen, Yao, & Kotha, 2009, p. 199). As already mentioned, the creation of a new venture is related to risk, and limited resources, thus entrepreneurs' entrepreneurial passion may play a major role in the all entrepreneurial process (Cardon, Gregoire, Stevens, & Patel, 2013).

Cardon, Sudek, & Mitteness (2009) argue that business angels consider entrepreneurs' passion as a necessary condition to either invest in a start-up or not. In opposition to this, Chen et al. (2009) couldn't find any relationship between company's ability to raise funding and passion. In this case, the authors justify this conclusion based on venture capitals experience, which rather prefer the business plan content.

In table 4 is presented a summary of the definitions found in the literature of the personality trait and the authors that defend that these traits are important for the start-up's success.

Table 4 – Important personality traits for the start-up success.

Personality Trait	Definition	Authors
High Need For Achievement	Someone with a higher need for achievement *"chooses tasks of moderate difficulty, accepts responsibility for results, and seeks feedback on action outcomes. It is important for entrepreneurship because entrepreneurs need to be interested in the tasks that they are doing to perform well"* (Rauch & Frese, 2007, p. 358)	Begley & Boyd, 1987; Caird, 2013; Collins et al., 2004; Lee & Tsang, 2001; Shane et al., 2003
Internal locus of control	The entrepreneur believes that an event happened because of his skills and capacities and that he made that happen so it can be said that he has internal locus of control (Rotter, 1966)	Kessler, 2007; Lee & Tsang, 2001
Risk propensity	"*accumulative result from the risk tendencies of this person*"(Landqvist & Stålhandske, 2010, p. 11)	Begley & Boyd, 1987; Wooten et al., 1999
Resilience	"*Resilience is best defined as an outcome of successful adaptation to adversity*." (Zautra, Hall, & Murray, 2010, p. 3)	Ayala & Manzano, 2014
Entrepreneurial passion	*"An entrepreneur's intense affective state accompanied by cognitive and behavioural manifestations of high personal value*"(Chen et al., 2009, p. 199)	Cardon et al., 2009; Cardon et al., 2013

FOUNDER'S CHARACTERISTICS: EXPERIENCE

One of the characteristics of entrepreneurs that is often referred in the literature is experience. It is the founders and entrepreneurs that are going to define the strategy of the start-up, so their former experience can be crucial in this process. Thus, it will be the entrepreneur that will make crucial decisions, develop strategies, gather resources, as well as transform those resources into something useful for the company, since resources alone are not sufficient to achieve competitive advantage and success (Kakati, 2003).

Those founders with no professional experience, which are usually called "*Engineers in a garage*", typically their companies experience smaller growth rates and are less invested by venture capitals than those teams with more experience. More experienced entrepreneurial teams will, later, have more probabilities of attracting experienced executives to integrate top management team: "*experience in a new venture is limited by what came before*" (Burton & Beckman, 2010, p. 3). Also, Tim Vieira, a renowned Portuguese entrepreneur, in an interview conducted by Costa (2016)

mentioned that experience is the most important variable to a successful entrepreneur. However, what type of experience is important?. Song et al. (2008) couldn't find any significate relationship between R&D experience, and prior start-up experience of the entrepreneurial team with the technology venture performance, despite the fact that R&D is an important factor for the success of the start-ups (Chorev & Anderson, 2006). Instead, it was discovered that industry experience and founders' marketing experience had an influence on the venture performance (Song et al., 2008). Also, Lee & Tsang (2001) in their study also found that industry and managerial experience have the most influence on venture growth.

In opposition, Silva (2016) didn't find in her study any positive relationship of the industry experience of the founder and marketing skills with the success of the start-up. Instead, the author says that the marketing skills have a negative and significant influence in the success of Portuguese start-ups. The author explains this by saying: *"Though it is expected a positive effect, the results may indicate that marketing skills have been overrated by the founders regarding the path of the startup or the marketing strategies are incorrectly implemented regarding the product and services of the startups*" (p.34).

One important aspect that Silva (2013) mentioned in the failure factors is the commercial area. Usually, because it is difficult for start-ups in general to hire a commercial, founders are the ones that will take this role. So, if they do not have any commercial experience or skills/competencies within the area, this can lead, in short/medium term, to the failure of the start-up since it will create a commercial obstacle and Influence, negatively, the sales.

1.3.2 START-UP STRATEGY

In 1980, Porter in his book "*Competitive Strategy*" has defined three strategies to gain competitive advantage. These were:

1. Overall cost leadership: The objective of this strategy is to have lower costs relatively to their competitors so that they can compete with lower prices of the product. To achieve this, they need to have a high attention to the cost control, and "*reduce the costs in areas like R&D, service, sales force, advertising, etc."* Also, in the beginning, to implement this strategy they will have to invest in "*state-of-the-art equipment, aggressive pricing and start-up losses to build market share*" (p.36);

2. Differentiation: The objective of this strategy is to have a product that can be perceived as unique in the market. This strategy normally isn't compatible with high market share, and it requires "*extensive research, product design, high-quality materials, or intensive customer support*." (p.38);

3. Focus: The objective of the focus strategy is to focus on a "*particular buyer group, segment of the product line, or geographic market*". This entire strategy will be elaborated with a specifically with a target in mind, which will help the company to gain competitive

advantaged since they serve this goal more effectively or efficiently. The company will then achieve "*either differentiation from better meeting the needs of the particular target, or lower costs in serving this target, or both*" (Porter, 1980, p. 38).

Besides these generic strategies, the author also mentioned the "stuck in the middle" position. This happens when a company cannot develop one of the three strategies, which will cause a low-profitability. Dess & Davis (1984) also found that companies that fail in developing one strategy, that are "stuck in the middle" will have lower performance than those who can commit to one strategy at least. He also said that those who chose a cost leadership strategy normally would have a highest average return.

Kakati (2003) in his study concluded that those companies that use multiple competitive strategies in concert have better performance and that those who can "*emphasis on meeting unique customer requirement and tastes at shortest possible time*" which can be considerate equivalent to a focus strategy, have better performance. In a more recent study, Nandakumar, Ghobadian, & O'Regan (2011) argue that cost-leaders and differentiators had better performances than those "*stuck in the middle*". Also, integrated strategies do not perform as well as cost leadership and differentiation.

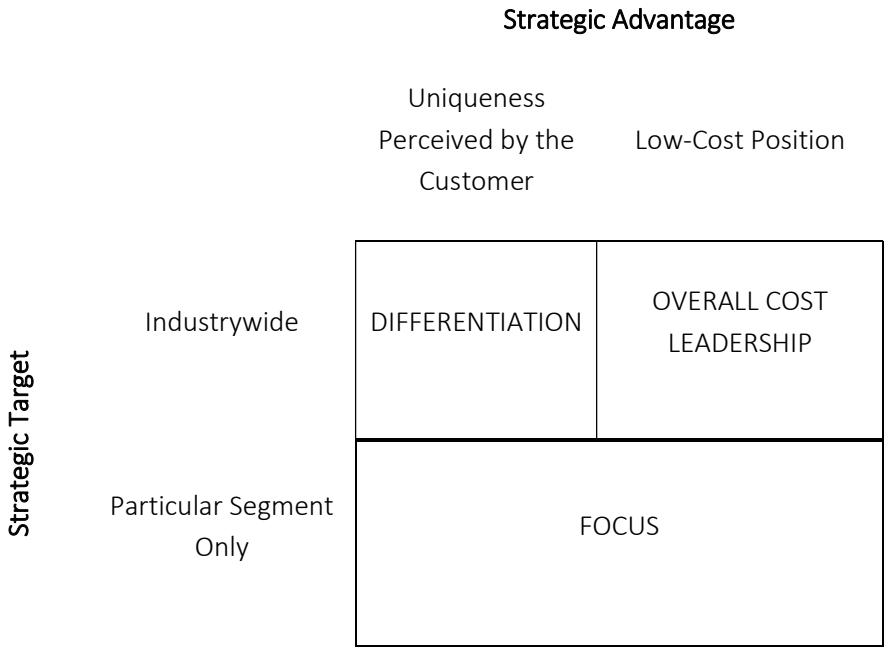

Figure 2 - Porter's Generic Strategies (adapted from Porter, 1980, p. 39)

Strategic management it is a critical factor to success when developing a start-up (Silva, 2013) but it is important to have the flexibility to adapt and formulate this strategy according to the dynamic situations that influence the start-ups (Chorev & Anderson, 2006).

START-UP STRATEGY: BUSINESS MODEL

The definition of the business model is an important part of the start-up strategy. The business model can be defined as "*the representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network*" (Shafer, Smith, & Linder, 2005, p. 204) and it helps the company to "*analyze and communicate strategic choices"* (Shafer et al., 2005, p. 204). Zott, Amit, & Massa (2011), in the line of the previous definition, says that a business model is an important tool of analysis that tries to explain how the companies do their business and create value. Morris, Schindehutte, & Allen (2005) mentioned that a business model it's "*a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets*" (p. 727), while Doganova & Eyquem-renault (2009) defined business plan as "*a narrative and calculative device that allows entrepreneurs to explore a market and plays a performative role by contributing to the construction of the techno-economic network of an innovation*" (p. 1559).

Shafer et al. 2005 argue that a well-elaborated business model increases the probabilities of success of a start-up, but the entrepreneurs have to be aware of *"(1) flawed assumptions underlying the core logic; (2) limitations in the strategic choices considered; (3) misunderstandings about value creation and value capture, and (4) flawed assumptions about the value network*" (p. 204) which can cause problems and real challenges to the start-ups. Usually, entrepreneurs choose to adapt existing business models to their strategy (Doganova & Eyquem-renault, 2009).

Therefore, a business model is an important tool to develop the company strategy, help the company to create value and could increase success.

START-UP STRATEGY: BUSINESS PLAN

As mentioned by Kropp, Lindsay, & Shoham (2006), *"part of making the new entry decision involves actively monitoring the environment, researching the market, arranging finance, and writing a business plan" (p.104).* A business plan can be defined as "'*a written document that describes the current state and the presupposed future of an organisation"* (Honig, Carmel, & Karlsson, 2004, p. 29).

Several authors argue that a new business that chooses to develop a business plan has bigger chances of success (Costa, 2016; Hyder & Lussier, 2015). Silva (2016) reached the same conclusions and states that an adequate business plan has a positive influence on the success of the start-ups, even though this relation is not significant. In the same line, Chorev & Anderson (2006) stated that the business plan "*has to be clear and based on realistic market needs*" (p.168).

Silva (2013) also achieves the same findings about the importance to have a concise and detailed business plan. Moreover, Silva (2013) argues that usually entrepreneurs do not understand their

importance, and don't even know the utility of the business plan, mostly due to the lack of experience. Following this, Hyder & Lussier (2015) claims that entrepreneurs should be supported during business plan elaboration to help them because in the most of the cases they do not have enough experience and knowledge to do it properly.

In turn, Tim Vieira mentioned that business plans are essential for the start-up success, but not in early stages. For this entrepreneur, it is important to have the flexibility to "*reshape, redefine or even radically changing business…*" (Costa, 2016, p. 31), and that the only thing that matters is to have the right resources, both financial and human. Selig (2014) also shares the same idea and defends that the business plan as to be flexible and the entrepreneurs should look into three scenarios, "*the best worse and most likely case*" (p.3).

1.3.3 START-UP RESOURCES

Most research papers in the field of start-up success mention resources as a crucial factor for the development and growth of a new company. There are two different types of resources: 1) tangible: such as financial capital, infrastructures, materials, and 2) intangible: such as networking, intellectual proprieties, the knowledge. Following this, a more detailed description of tangible and intangible resources will be provided, considering the most relevant resources within the literature: (1) Financial Capital, (2) Networking; (3) Team; (4) Professional Advisors; and (5) Patent Protection.

START-UP RESOURCES: FINANCIAL CAPITAL

The statement "*there ain't no such thing as a free lunch*" is pretty known in the society, and it could be applied to this topic. To develop, grow and expand start-ups will need funding, and it is widely accepted in the literature, and in the business field, that this is one of the most relevant resources for the development of the companies. Thus, it is important to know where the start-ups can get the financial capital.

This financing sources can be the following:

a) Founder, Friends and Family: "*An individual who uses his own money to provide capital to a private business owned and operated by a family member, work colleague, friend, or neighbour*;" (p. 87). Normally this type of funding is used at the initial stage of the start-up development (Vasilescu, 2009);
b) Business angels: they are individuals that besides investing in the start-up, also contribute with managerial knowledge, and most of the times are critical to the survival of the start-up (Vasilescu, 2009);
c) Venture Capitalists: they are institutional investors, that "*use the money raised from another party to provide capital to a private business owned and operated by someone else*" (p. 87).

The biggest problem with the venture capitalists is that prefer start-ups that are already in a late development stage (Vasilescu, 2009);

d) Non-financial corporations;
e) Equity markets;
f) Commercial banks;

These types of funding sources are more adequate in different stages of the start-up's life cycle. According to the Figure 3, Founder, Friends and Family or, usually designed by 3F's, normally take or are willing to take a higher risk of investment in comparison to the other types of funding sources. Normally they are used at the beginning of the start-ups. The business angels in the other hand, don't want to take as much risk as the 3F's, but still, the risk level is very high comparing with equity markets and commercial banks. This last two types of funding, normally don't want to take high risks and only invest when the business is already established.

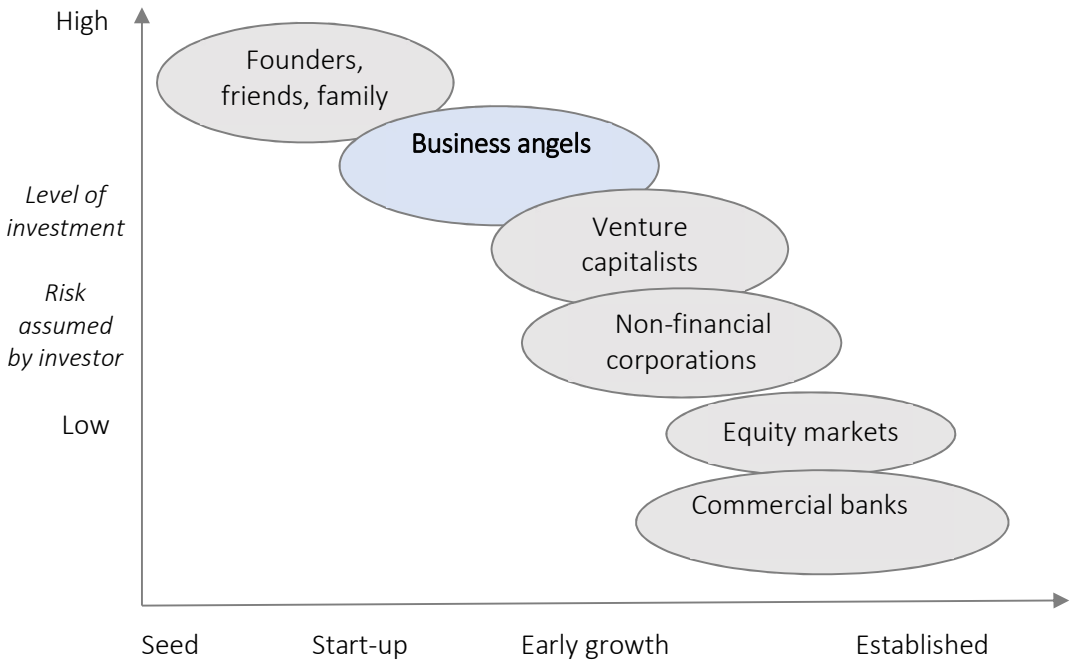

Figure 3 - Financing sources (Vasilescu, 2009, p. 94).

One of the main reasons for business failure is the lack of capital (Hyder & Lussier, 2015) and problems with funding (Silva, 2013). Capital is related, directly or indirectly, with the general performance of every company (Silva, 2016), and can even boost performance (Song et al., 2008). Also, to open a business, usually, entrepreneurs must wait until funding resources become available and this can prove to be difficult (Kessler, 2007; Song et al., 2008).

Although this is an accepted fact, Kakati (2003) didn't find any significant difference between successful and unsuccessful ventures regarding financial aspects, such as the liquidity of the investment. Also, the majority of the start-ups studied by Silva (2016) initiated "*their activity with insufficient capital to conduct normal business operations and pay creditors, undercapitalized*" (p.31). The author detected a negative influence of undercapitalization in the start-up success, but this influence was not significant for the start-up success. Hyder & Lussier (2015) concluded that in capital-rich countries the variable capital inadequacy it's insignificant, while in a capital-starved country where this variable is critical for the business success. This can be a valid justification for the findings of Silva (2016), or maybe she just didn't find any significant influence because almost all the start-ups she studied start undercapitalized. In opposition Selig (2014) sees undercapitalization as a major impediment for a successful entrepreneurship journey.

Silva (2013) mentioned that the incorrect evaluation of the needs of capital, or even the lack of perception of their capital needs, will cause problems of lack of capital in the start-up, and normally these companies do not have a contingency plan to overcome this situation. The author also refers that sometimes, when the company have an excess of capital, they lack the focus on what it is critic to achieve success, causing an excess of demand offer that the market probably doesn't have the means to absorb, which consequently will lead to the failure of the start-up.

START-UP RESOURCES: NETWORKING

Kessler (2007) defined networking as: "*Useful professional contacts in circle of friends/acquaintances and from previous employment*" (p.388). He concluded that networking had one of the highest correlation with the start-up success in Austria, while in the Czech Republic it did not have any significant influence. The author, according to the importance of the network in Austria, mentioned that this indicates a change in the importance given to the founder and his initial financial situation to the social resources like networking. Also, "*the presence of direct and indirect ties to venture investors prior to firm founding—sharply decrease the hazard of mortality and increase the likelihood that start-ups obtain external funding*." (Shane & Stuart, 2002, p. 168). Other authors have also stated that networking is a variable that can affect the success of the company (Silva, 2016; Silva, 2013).

Silva (2013) stated that sometimes the entrepreneur does not believe in the benefits of relationships, so they do not "*waste*" their time building them. Besides this, the author also observed that there's a lack of networking in incubation centres mainly because these centres limit themselves to renting spaces, instead of promoting the networking. On the other hand, Chorev & Anderson (2006) conclude that the networking is one of the less important topics when talking about the start-up success, which backs up the findings of Silva (2013).

A consequence of networking can be the development of business partnerships, and in some cases, this can be relevant for the success of a start-up (Chorev & Anderson, 2006; Hyder & Lussier, 2015; Selig, 2014), but partnerships are also difficult to obtain (Chorev & Anderson, 2006; Silva, 2016).

Hyder & Lussier (2015) argue that usually, businesses that start with partnerships have a higher chance of success than those who do not establish any collaboration with other companies.

START-UP RESOURCES: TEAM

Usually, a start-up is created by an entrepreneurial team, rather than a single entrepreneur (Visintin & Pittino, 2014), so it is important to know how they can influence the success of the start-up.

Chorev & Anderson (2006) argue that "*core team expertise, diversified knowledge and harmony are essential for success*" (p. 168). These characteristics are one of the most important for start-up success, and normally when founders lack some expertise, consultants or professional advisors can be useful. The team commitment and diversity are also a key factor for the start-up success (Chorev & Anderson, 2006), as well as, the combination with academic and non-academic members in the entrepreneurial team (Visintin & Pittino, 2014).

START-UP RESOURCES: PROFESSIONAL ADVISORS

Since the initial phase of a start-up can be difficult, and the access to some resource, such as networking or financial capital, can be limited, the existence of professional advisors can play a major role in company's survival, because they are "*recognised for their expertise related with the business and their network which is very important to overtake the liability of newness*" (Silva, 2016, p. 37). Despite this, Silva (2016) concluded that this variable had a negative effect in the start-up success. In opposition, Hyder & Lussier (2015) and Lussier & Corman (1996) argue that the use of professional advisors will increase the chances of success of the start-up, and entrepreneurs should use the expertise of this mentors to develop their businesses.

START-UP RESOURCES: PATENT PROTECTION

Intellectual property is an intangible asset of a start-up and may be critical for its success, especially if the company is considered a spin-off company. Examples of intellectual property are, e.g., trademarks, patents, designs and copyrights, trade secrets (Wilton, 2011).

Considering the literature review, only Song et al. (2008) highlighted the importance of patent protection on the success of the start-up, a type of intellectual property. Patent protection aims to protect an invention, product or a service, and as a consequence, it enables a start-up to have: "*risk reduction; freedom of action; licensing income; design access*." (Bader, 2008, p. 204). Also, the start-up needs to align their intellectual propriety strategy to the business strategy. Because of the costs that, for example, a patent can bring to the company they need to decide if the benefits they will gain with it are worth the costs (Wilton, 2011).

1.3.4 START-UP SUCCESS FACTORS: THE MODEL

Based on the literature review performed it is possible to highlight the most relevant success factor related to start-up companies (see Figure 4), and, thus, provide insights regarding the following question: "**What impact start-up competitions does have in the success of start-ups?"**

Following this, three groups of factors can be considered: founder-related, strategy-related and resources-related. These factors can be interrelated and could influence each other.

Firstly, the group related to the **founder** implies factors linked to founder traits and founder characteristics (such as age, education, and experience). Concerning entrepreneur's personality traits only five are considered: high need for achievement, internal locus of control, risk propensity, resilience and entrepreneurial passion.

Secondly, the group related to **strategy** encompasses the definitions of the business model and business plan, since both will influence how the start-up will develop and prosper.

Thirdly, the group related to **resources** includes: financial capital, networking, team, professional advisors and patent protection since all of them can help the start-up achieve success.

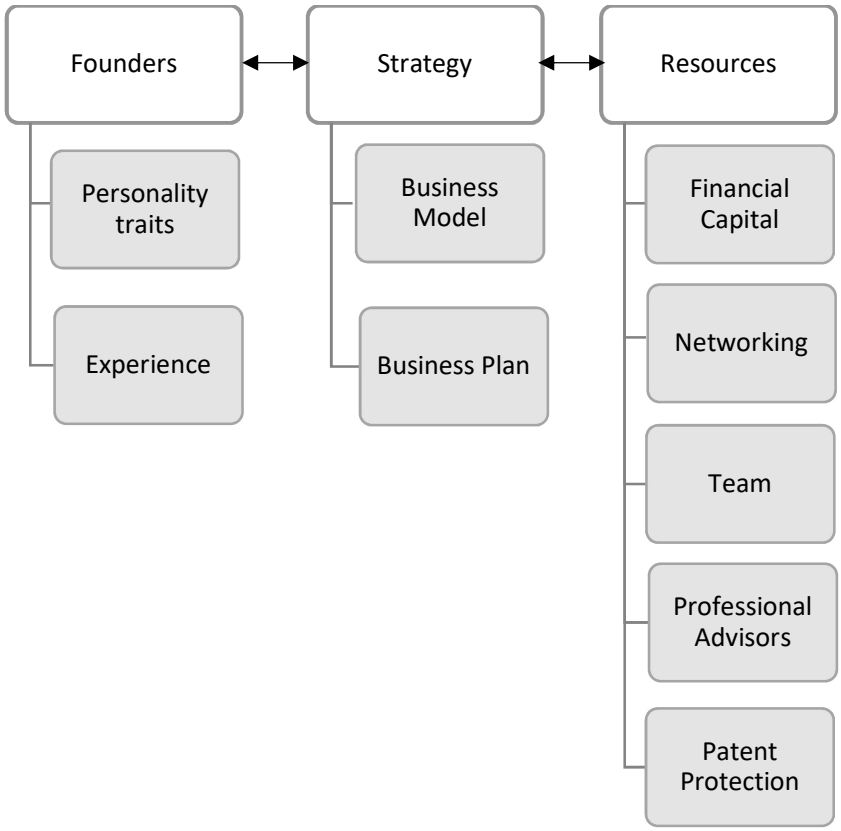

Figure 4 – Proposed Model.

2. METHODOLOGY

The purpose of this chapter is to explain and justify the research methodology adopted to understand the influence of entrepreneurial competitions in start-ups success.

According to (Yin, 2003), case studies should be used when the investigation questions aim to find out "How?" or "Why?", which goes with our main question: "How does the start-up competitions influence the success of start-ups?". The case study is more appropriated when studying contemporary events that cannot be manipulated which is the case since our study is going to be about the influence that start-up competitions have on start-ups success. Also, instead of a single case-study, there's the multiple case-study that, as what happens with laboratory experiments, offers more reliable conclusions (Yin, 2003).

The process used to address the research question consisted on gathering data from different sources. After the description of the cases, the information was organised, codified and analysed accordingly to the variables, through a comparative approach.

Therefore, a multiple case-study research methodology was used to analyse a group of start-ups that participated in a start-up competition, as well as some specialist in the subject matter, with qualitative and quantitative information.

2.1 RESEARCH DESIGN

Contemporary research questions are more complex than ever, requiring complex methods for finding answers (Bickman & Rob, 1998). The "*how*" and "*why*" questions are more adequate in conducting research related to exploratory research topics. Considering that the phenomenon under investigation, which aims at understanding a real and complex issue, it was selected the method of case study for conduction the research.

The case study method encompasses a full set of procedures which includes designing a case study, collecting the case's data, analysing the data, and presenting and reporting the results (Yin, 2012). Also, this method is not limited to any single type of evidence or data encompassing the usage of "*different data sources and techniques such as focus group, ethnographic, participant observation, key interviews, documentary evidence, access to archival methods, direct observations in the field, and surveys*" which contributes to triangulate or converge on the research question (Bickman & Rob, 1998, p. 260).

Although single case study is more simple to implement, the multiple case studies provide more convincing and reliable data, and it also allows the investigation of broader topics than single-case studies (Yin, 2012). A specific number of cases within this method is not mandatory. Nevertheless, the sample should be determined to provide more confidence or certainty in the study's findings (Yin, 2012).

After the definition of the study, a deep literature review process was made in order to identify and characterise the relevant variables related to the research question. Using the Scopus database several searches were made between - February and June of 2017 - using different expressions and divergent results were produced. Since the theoretical background is very broad it was used a snowballing procedure to identify the most relevant publications related to the goals of the study.

Following Yin (2012), the present study comprises 5 cases, and each one includes:

- Interviews (e.g. open-ended conversations with key participants);
- Archival records (e.g. newspaper articles, letters and emails, reports);
- Observation (e.g. field notes).

Considering a set of 9 nominal variables identified in the literature review, a research protocol was produced and followed to ensure rigour and validity concerning the data gathered.

As a starting point, a pilot test was conducted through two interviews to refine the research questions, improve the questionnaire, highlight meaningful data not considered before, and improve the robustness of the study. The two experts invited are well-known professionals involved in the promotion of start-up's, and the Portuguese entrepreneurial ecosystem:

- Walter Palma is the director of Caixa Capital, a private equity & venture capital investor in Portugal with global reach. Caixa Capital has backed several start-ups in different competitions, including BGI-Building Global Innovators competition.
- José Fontes is the coordinator of entrepreneurship unit at Associação Nacional de Jovens Empreendedores – ANJE. This organisation have supported for, at least 20 years, several entrepreneurial projects during creation and development phases.

The pilot cases were selected taking in consideration the experts' background and experience. In order to validate the questionnaire, the interviews process was more open. The integration of these interviews was very relevant since it contained detailed information about the structure of the competitions, the different funding bodies, and description of the development phases of companies.

After the pilot, interviews with open-ended questions (annex 2) were used to generate qualitative data starting from general questions to, gradually, more direct and focused questions (funnel sequenced questions). With this technique, it was possible to cover many topics and allowed the understanding of respondents' viewpoints and perceptions.

The analysis of the interviews was made considering paragraph structure since it exposes more clearly the opinion of the interviewed. Considering all documents gathered (Word, PDF, Audio and HTML), and to ensure the reliability of the study, software QSR NVivo was used, since it is a software that supports qualitative and mixed methods research. The archival data used emerged from different data sources to withdraw any possible biases.

To assess founder's traits, a quantitative approach was used. A questionnaire (annex 3) embedded five subscales (68 items), founded in the literature, corresponding to five key entrepreneurial traits – entrepreneurial passion, resilience, risk propensity, locus of control, need for achievement – and the measurement was made through a 5-points Likert scale (1 = strongly disagree, 5 = strongly agree). The form was designed as represented on Table 5.

Table 5 – Founders Traits Questionnaire

Section	Questions	Number of items	Variable	Source
1st	Entrepreneur identification	-	-	-
2nd	Q1-Q10	10	Need for achievement	Rego, 2000
3rd	Q11-Q20	10	Risk propensity	Hung & Tangpong, 2010
4th	Q21-Q30	10	Locus of control	Mueller & Thomas, 2001
5th	Q31-Q43	13	Entrepreneurial passion	Cardon et al., 2013
6th	Q44-Q68	25	Resilience	Connor & Davidson, 2013

Considering the exploratory nature of the research, and since there are still gaps in the literature in this field, the present work proposes the assessment of the proposed adopted model through multi-case study comparison.

2.2 CASE SELECTION

Currently, several start-ups competitions are running in Portugal, but significant differences between them could be pointed out. Some of those aim at helping entrepreneurs to develop ideas and innovative projects (like Arrisca C or InovUbi) and only provide support in an early stage of start-up's development. To participate in these type of competitions is not mandatory to have an established company. In turn, business accelerators (such as Lisbon Challenge and Building Global Innovators) aim at supporting entrepreneurs to scale the (technological) business and to raise funding. These type of programs is oriented to start-ups already established which have funding and scaling-up needs.

The cases selected are start-ups, all grand winners from a single international competition based in Portugal called Building Global Innovators (BGI). Since this competition is organised conjointly between the Instituto Universitário de Lisboa (IUL) and the Massachusetts Institute of Technology (MIT), it was considered adequate to assess the impact in the variables identified in the literature review. Also, the reputation of the competition and the success rate of start-ups under the program have contributed to the selection.

This yearly competition run from 2010 and only five start-ups were considered in the study. Table 6 summarises the grand winner of each edition of the BGI. After the identification of the sample, several steps to gather data were followed as identified in Table 7.

Table 6 - BGI grand finalists

Edition	Grand Finalists (Winners)
1st	Movvo
2nd	Musikki
3rd	Veniam
4th	Glucowise
5th	Nu-Rise
6th	Fibersails
7th	Kinetikos

Table 7 - Main steps of data collection

Steps	Description
Initial Research	Internet search and website reading
Initial Contact	Email to case promotors and phone call.
Archival	Detailed collection of external documents
Interviews	Interviews with promotors

The interview guide had five main parts (see Table 8). The first part focused on the company description, its history, the motivations, and expectation to participate in BGI. The second part consisted in knowing the entrepreneur and its personal characteristics. The third part was focused on the start-up resources. The fourth part was related to start-up strategy and the relevance and change of business model. The fifth and last part was more open in order to provide a broader overview of the start-up context.

Table 8 - Interview script structure

Interview script	Goal	Number of questions
1st part	Start-up history	5
2nd part	Founders	2
3rd part	Resources	5
4th part	Strategy	4
5th part	Success Factors	2

Considering the 5 cases, 2 interviews were made in person and 3 were made using Skype (online application) since the entrepreneurs were not at Portugal (see Table 9), and were also interviewed 2 experts, one using skype and the other one in person (see Table 10), in a total of 231 minutes and 22532 words.

Table 9 - Founders Interviews

Start-up	Person interviewed	Position	Channel	Duration	Words
Movvo	Roberto Ugo	Founder	Skype	26 min	1853
Musikki	João Afonso	Founder	Skype	40 min	4368
Veniam	Susana Sargento	Founder	In person	27 min	2533
Nu-rise	Luis Moutinho	Founder	In person	52 min	3479
Fibersails	Pedro Pinto	Founder	Skype	26 min	2555

Table 10 - Experts Interviews

Entity	Expert	Position	Channel	Duration	Words
Caixa capital	Walter Palma	Investment Director	Skype	30 min	2723
Anje	José Fontes	Entrepreneurship Coordinator	In person	30 min	5021

The interviews were carefully transcribed, for 3 weeks, and resulted in a set of 7 word documents. The information gathered was analysed considering the steps presented in Table 11.

Table 11 - Data Analysis

Steps	Description
Data transcription	Full transcription of the interviews Correction of inaccuracies through a second analysis.
Data reduction	Correction and/or elimination of pauses, mispronunciations and incomplete sentences
Case description	Writing the history about the spin-off, crossing the interviews and other material
Data organization	Development of structured tables with generic and specific information
Codification	Codification of the interviews using structured tables. Codification of the interviews using QSR NVivo.
Analysis	In depth analysis of each case in the light of the research question. Cross case analysis to identify patterns and relationships.

In order to address the research question, other sources were used to enable triangulation such as official news, company press releases and other diversified news.

3. START-UP COMPETITION & CASE STUDIES DESCRIPTION

During the first chapter, several variables were identified as relevant for the success of start-ups. Also, it was explored the linkages between the start-ups and the ecosystem that surrounds these companies.

Within this section, using the model built previously, it will be assessed the importance of different factors that underpin the start-ups' success, through a multi-case study approach.

3.1 START-UP COMPETITION: BUILDING GLOBAL INNOVATORS

During the last decade in Portugal, several entrepreneurship competitions were promoted both by public and private organisations. Although some differences related with organisation and target groups, those competitions had the common purpose of promoting new start-ups. There are several start-up competitions that include business acceleration programs in their competitions, where they offer mentorship, formation, and financing. Table 12 summarises the main start-up competitions in Portugal related to business acceleration program.

Table 12 – Start-up competitions in Portugal

Contest	Organization	Focus	Number of editions	Start year	Number of winners
COHiTEC	COTEC Portugal	Researchers whose technologies respond to the market	14 editions	2004	Until now, 37 companies of technological base were created and received 39M of financing
Building Global Innovators (BGI)	ISCTE-IUL, MIT Portugal and Caixa Capital	Tech start-ups with less than five years and with revenue < 2,5M	8th edition in progress	2010	Accelerates twenty global start-ups per edition. Four track finalists and one grand finalist
Lisbon challenge	Beta-I	Tech start-ups with no previous investment	7th editions until 2016	2012	Ten start-ups invested and accelerated per edition
Startup Braga Acceleration program	Start-up Braga	Technological products in prototype phase,	4th edition in progress	2014	Ten projects accelerated, five teams go to the USA roadshow,

Contest	Organization	Focus	Number of editions	Start year	Number of winners
		with at least one full-time member			and one will receive the 100k investment
Ineo Start	Institute Pedro Nunes (IPN), University of Coimbra and jeKnowledge		3rd Edition	2015	-
ASA – ANJE Startup Accelerator	ANJE; University of Porto and TecMinho	Start-ups with high technological base	3 editions	2015	Ten accelerated start-ups that will receive a prize pool worth a total of 180k
Startup Porto Accelerator	ANJE and INESC TEC	Technologically based entrepreneurship	1st edition	2017	Ten start-ups with a prize money of 5K
Spin+	RIERC	Start-ups or Spin-offs that are incubated with a technological base; new entrepreneurs; start-ups until two years of activity	-	-	Ten best projects receive an award of 5k
Tourism Creative Factory	Tourism of Portugal	Students and ex-students of the Network of Schools of Hospitality and Tourism of Portugal	1st edition	2017	-

After analysing all of these competitions, BGI was the selected competition to be considered in this study. The BGI - Building Global Innovators - is a Portuguese start-up competition started in 2010 and promoted together by ISCTE-IUL, MIT Portugal, Caixa Capital, Deshpande Center for Technical Innovation and the Martin Trust Center for MIT Entrepreneurship. This competition takes the form of a business acceleration program, and it is ranked on the top 20 accelerators in Europe (Fundacity, 2014). BGI is already in the 8th Batch Call Open and has supported 117 start-ups, with a 73% survival rate, 110M€ capital raised and 727 highly qualified jobs created (BGI, 2017).

The BGI is open for tech start-ups with less than 5 years, less than 2.5M revenue and working in one of these markets: Medical devices & Health IT; Smart Cities & Industry 4.0 Solutions; Enterprise IT & Smart Data; and Water Economy, and requires a 2-3% equity in a pre-money valuation over 2M€ (BGI, 2017). As participating in the program, teams are guided to go from an investment focus to a

market focus, to avoid premature dilution, to validate their product in the market and so de-risk the start-up, and also to help them to achieve a pre-money valuation (BGI, 2016). To this, the program promotes personal mentoring, boot camps, access to a wide networking of investors, corporate, potential partners and help them to get the best funding opportunities (BGI, 2017).

As we can see in Figure 5, this program has four phases after the batch call. The first phase consists in two boot camp with experts in each of the market application verticals and usually runs for 1 to 2 weeks each. Also, the teams are assigned with a mentor that will help them construct their go-to-market strategy during the three months, and with a one-hour meeting per week. The second phase is the demo day, where teams will present their pitch to a group of entrepreneurs, industry leaders, investors and community members. The third phase is the final boot camp that will happen in Boston, Massachusetts, and where teams will present their start-up pitch to potential investors, clients or partners. The latest phase is the venture phase with investment sessions that can last up to 5 years (BGI, 2017).

Figure 5 – BGI Program phases 8th edition (Source: BGI, 2017)

The winning start-up would receive a monetary prize. In the first four editions, the winner was announced at the Demo Day, and the winner of each track received 100k. Then by February, in the second Demo Day, it was announced the grand finalist from those four winners, and it would win an extra 100k, making a total of 200k. After the 5th edition, and because Caixa Capital changed their model, it was only selected one winner of the four tracks. After this, Caixa Capital gathered all winners from all the start-up competitions with acceleration programs in Portugal and chose the grand finalist from all the ecosystem, that would get the extra 100k award. According to Walter Palma, this change happens because when they made the first partnership with BGI, in 2010, this program was the only one doing something valuable regarding acceleration programs and this has changed over the last years.

3.2 CASE STUDIES DESCRIPTION

3.2.1 START-UP CASE: MOVVO

Created in 2009 in Porto, Movvo company defines itself as a "*high-growth SaaS platform delivering Behavioral Intelligence and Live Engagement services to the Retail Real Estate and Retail sectors*." It was created by three academic researchers, Diana Almeida, Roberto Ugo di Cera and Suzy Vasconcelos. Those entrepreneurs have developed a technology that was able to "*captures and interprets the radio frequency footprint of shoppers as they move around a physical environment*". Their objective is to help owners of retail spaces to "*analyse, predict and influence*" the movements of their visitors.

In 2010, when they won the BGI, the company had a different name: BIPS – Around Knowledge. According to Roberto Ugo, it all started with the identification of a problem, which was not knowing where people were in shopping centres or other closed spaces. At that time, they developed a prototype in the university, and as soon this prototype was ready they went for the patent protection's provisional request via the USA. Because they could not find a client that would pay to test their system, they had to make another project application to get money, so that the start-up would survive. Roberto Ugo said that at the time probably was a bad idea to go through the process of opening the start-up, one and a half year before the BGI, because they did not have any source of funding, and were a little bit "*naïve*". Despite this, it was this process that made them win the contest, and evolve to what they are today.

The team decided to enrol in the BGI because they saw a news article in the media about it and they thought that was a unique opportunity, especially because of the involvement with MIT Portugal. Roberto said that at the time there wasn't any competition of the same relevance of BGI in Portugal, since they were the winners of the 1st edition, and, they were attracted by the mentorship, the contact with the USA and the financial award.

Nowadays, with a B2B approach, their headquarters are in London, and they have an R&D facility in Porto, and their technology can be found in the USA, Europe, Asia Pacific and Africa.

3.2.2 START-UP CASE: MUSIKKI

Created officially in 2012 at Aveiro, Musikki has developed an app that allows consumers to have access to music data, content, and information easily and quickly. Dubbed the "*IMBD of Music*" it "aims *to bring together all the World's musical knowledge, content and services*". This project was born in 2010, from a personal necessity from João Afonso, one of the founders of Musikki. He mentioned: "*I was always connected to music, and it bothered me having to jump from place to place looking for information; if I found some new band or music in an online magazine that I wanted to listen, I had to go to YouTube, if I wanted to buy it I had to go to Amazon, I wanted to know something about it I had to go Wikipedia"*. He was aware that, technologically speaking this could be all together, so he created an algorithm that identified and joined all that information. At the time, he created

this only for him, only afterwards he showed this project to two friends, that became the co-founders of Musikki (Juliana Teixeira and Pedro Almeida), and they all decided to improve it into something that everyone could use.

João Afonso was looking for several competitions in 2010, and there weren't many choices. They became aware of the BGI after a roadshow that happened at the University of Aveiro.

However, before enrolling in the BGI, they also participated in an innovation competition but were not selected for funding. Despite not winning, the experience of participating in this competition enabled them to develop their APP and to implement it online. As a feedback, they got an extremely positive feedback from the consumers and having visits from over 100 countries. Also, they were mentioned on Mashable, one of the largest websites of Social Media, and on a popular music blog. After receiving this validation from the final user, they improved the APP and the communication strategy, where they tried to explain the concept, the problem, the function, the business, and business potential. João, regarding the innovation competition, mentioned that: "*It was a little bit frustrating, we thought that we had a cool thing, and after seeing the others we were not selected. However, what made us try again, and enrol in the BGI, was the validation of the final user, that we considered more important than the result from the first competition, and so we decided to apply for BGI*".

After winning BGI competition, the entrepreneurial team have applied to other entrepreneurship competitions, and they won some of them, either in Portugal or abroad (London). In the meantime, they change their business model. They passed from a B2C approach to B2B and launched a new product/brand, the Exclusiph.

3.2.3 START-UP CASE: VENIAM

Founded in 2012, Veniam company was created to exploit a technology developed within academia. It was founded by two academic professors, João Barros and Susana Sargento, and by two American experts, Roy Russel and Robin Chase. Susana Sargento mentioned that at the time they wanted to build networks between vehicles, and they plan to connect 500 vehicles to prove that the technology did work. Nevertheless, the team did not have the resources to implement it, since the equipment to enable the connection costed about 3k per unit. In the search for alternatives, they were able to identify some communication boards that were compatible with the standardisation that they wanted to apply. Therefore, they started to develop their proprietary technology, and they discovered that they could do more than what they wanted to, which initially just served to communicate emergency messages. They were always thinking of the several ways that they could use this new technology, and nowadays they offer Mobile Wi-Fi and data solutions to vehicles all over the world.

In 2012 when they heard about the possibility of participating in the BGI they thought that it was an interesting thing to do. Susana Sargento considers that the BGI was an interesting starting point to the start-up.

Nowadays they operate in New York, Singapura, and Porto. With more than 780.000 unique wi-fi users, more than 17M internet sessions, and more than 43M connected Km they won 10 major industry awards and continued to revolutionise the industry.

3.2.4 START-UP CASE: NU-RISE

Founded officially in April 2015 by Luís Moutinho, João Veloso and Filipe Castro, Nu-rise is a University of Aveiro start-up. This project was born from Luis Moutinho's master thesis and consists in using optical fibres to measure the radiation levels in the human body in real time and aims to improve cancer treatment. These fibres can also be utilised in the industry and in research instrumentation.

In 2012, Luis Moutinho participated in the CEBT Iberic organised by the University of Aveiro. This was when he realised that there was a market for his technology. Afterwards, they won the ArriscaC competition, with a prize of 1k which helped them validate the work done in the CEBT Iberic. By this time, they submitted the patent and gave an interview to a newspaper about innovative technologies. As a result of this interview, BGI contacted them. Different from what happened with the other winning start-ups, the BGI proposed them to participate in the competition, and so they did. After analysing every phase of the competition, they thought it was interesting to participate with an expectation of it begin a learning experience, because of all the training provided by the BGI. Also, the connection to Boston was one of the biggest motivation to enrol in this program.

Since then they have participated in several other competitions. Luís mentioned that: "*We are really focused on the work that we have to do, but at the same time we take the opportunity of these competitions because if they are no dilutive, they are always revenue sources that allow us to run some projects*". Also, he mentioned that participating in this type of initiatives was also relevant to build their contact network, as well as to gain experience. Nowadays, the team is concluding the clinical tests, and want to be out in the market by 2018.

3.2.5 START-UP CASE: FIBERSAILS

Fibersails was founded in 2015, with the mission of developing "*a shape sensing system based on FBG fibre optic research to monitor and analyse windmill blades in terms of shape, condition and behaviour. The real-time information provided will help wind turbine operators to maximise performance and availability while preventing failures and maintenance costs from their windmills."*

Fibersails was created to fulfil a problem that Pedro Pinto, as an Olympic sailing coach, and Hugo Rocha, as a competitive sailor and Olympic medalist, encountered in their occupations. Pedro Pinto mentioned that most of the time they were trying to understand the shape of the sail so that the boat could sail faster. It was in 2013 that the team joined up in a sailing competition and started discussing ways of doing this more efficiently. Then, Pedro and Hugo began looking for technologies

that could do this, and which one of them was the most effective. They found an optical fibre that NASA produced to run in their equipment's and then started developing their project from there. In the beginning, this project was directed to sailing competition, to measure the state of the sails and then they wanted to construct a prototype that could be applied to maritime transport, such as cargo ships.

About the reason to enroll in the BGI, Pedro explained: "*We decided to enroll in the BGI because one thing it's to have the engineering part, other it's to have access to all the rest, the know-how that we need; how to create the company; hiring techniques; how we're going to define the business plan; how we're going to create the value proposition; define our IP strategy. There's a bunch of things that we were not ready to do*".

After the BGI they felt the need to participate in a more corporate accelerator, PortXL, in Rotterdam. With a not so positive feedback comparing with the BGI, because it was the 1st edition, they thought it was interesting since it was related to the Maritime Business.

3.2.6 START-UP CASES: CROSS CASE DETAILS

In the previous section, each case was detailed described. To provide a global understanding of the cases and a more holistic view, Table 13 summarises the main characteristics of the cases. Also, shows the motivations under the start-up creation and the expectations related to BGI participation.

Table 13 - Cross Case Details

Edition	Grand Finalist	BGI Edition Year	Opening Year	Track	Reason to begin the business	Reasons to enrol in the BGi / Expectations
1st	Movvo	2010	2009	IT & Web	Research Project	The mentorship, the contact with the USA and the financial award.
2nd	Musikki	2011	2012	Products & Services	Personal Necessity	The validation from the final user made them want to try another contest.
3rd	Veniam	2012	2012	Sustainable Energy & Transportation Systems	Research Project	They thought it would be an interesting experience.
5th	Nu-Rise	2014	2015	Medical Technologies & Health IT	Master Thesis	The BGI contacted them to participate. They were attracted to the formation and connection to Boston.
6th	Fibersails	2015	2015	Ocean Economy	Job Necessity	To learn the know-how of creating a company.

4. RESULTS AND DISCUSSION

The present chapter aims to present the results and discussion, departing from the factors identified in the literature review, to understand the impact of competitions on start-ups success. For this purpose, the data is analysed considering the model presented previously.

The analysis of each category followed the framework presented within the literature review. The data analysis focused on 1) verifying the categories; 2) identifying new categories; 3) identifying the most relevant categories to start-ups success and 4) the impact of BGI competition on start-ups success.

The subsequent cross-case displays provide an integrated view of the five cases, allowing a straightforward comparison of the different dimensions.

FOUNDERS RELATED FACTORS

According to the literature review, young age and basic education normally aren't good predictors of success (Kakati, 2003; D. Silva, 2016). According to the data collected, our samples' age ranged from 26 to 38 years old (see Table 14).

Table 14 - Founders' Age at the time of participating in the BGI competition

	Founders' age
Movvo	26
Musikki	34
Veniam	36
NuRise	31
Fibersails	38

Concerning the level of education, our sample encompassed two entrepreneurs holding a PhD, 2 with a master degree and 1 with a degree. The results obtained suggest that high levels of education could enhance a successful business, which is in line with the findings of other researchers (Kakati, 2003; D. Silva, 2016).

About the **age and education,** it can be concluded that the results are in line with the literature. Considering the cases, the average age is 33 years old, and all the entrepreneurs have higher education levels. Regarding the education, all founders got their degrees before entering BGI. Nevertheless, all founders have agreed that participating in BGI was crucial to gain both management and marketing knowledge. Inclusively, one founder – from Movvo – stated that during BGI he felt the need to get new knowledge and education in the management field. After that, he applied to

an MBA. The other founders, during BGI, also realised that they need more knowledge but they used informal sources to cover their knowledge needs.

Regarding the **founder's traits**, Figure 6 presents the data collected through the questionnaire, which assessed: entrepreneurial passion, resilience, risk propensity, locus of control and need for achievement. Since this is an exploratory study, and the sample is quite small, it is only possible to take some preliminary conclusions. Also, it was not possible to collect the questionnaire from Fibersails.

The questionnaire included five subscales, with a total of 68 items assessed through a 5-points Likert scale (1=strongly disagree; 5=strongly agree). The global score was calculated considering the average of the items to ensure descriptive comparison.

Table 15 - Founder's traits: questionnaire results.

	Movvo	Musikki	Veniam	NuRise
Need for achievement	37	42	42	41
Risk propensity	32	29	32	38
Locus of control	30	25	29	36
Entrepreneurial passion	57	63	56	57
Resilience	105	111	92	104

The data obtained show similar personality characteristic among the different founders, and it was not found gender differences in the results.

Table 16 – Descriptive statistics of Founder's traits

	Number of items	Min	Max	Median	Average	Standard deviation
Need for achievement	10	3,7	4,2	4,15	4,1	0,238
Risk propensity	10	2,9	3,8	3,2	3,3	0,377
Locus of control	10	2,5	3,6	2.95	3,0	0,455
Resilience	13	4,3	4,85	4.38	4,5	0,246
Entrepreneurial passion	25	3,68	4,44	4,18	4,1	0,318

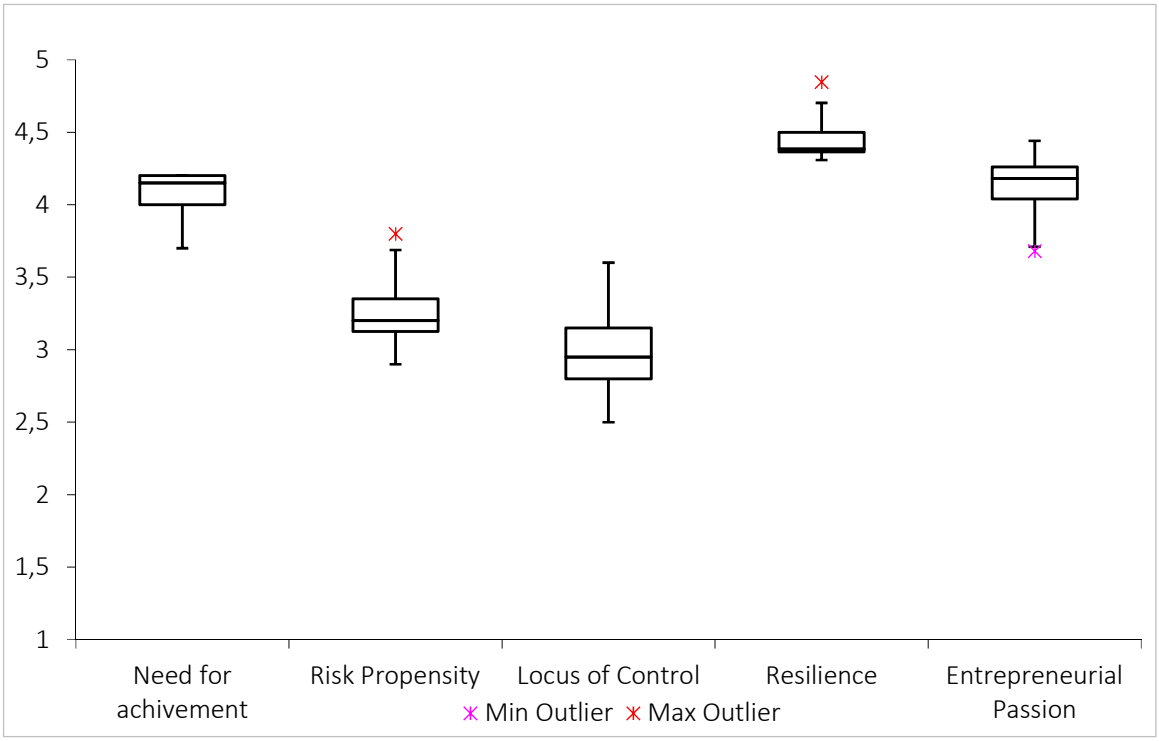

Figure 6 - Personality Traits

*C*onsidering the Figure 6, resilience is the personality trait with higher results and locus of control presents the lowest results. Also, locus of control appears as the personality trait with higher range while need for achievement performs as the lowest. Regarding the locus of control, according to Mueller & Thomas (2001), it can be considered that the entrepreneurs have internal locus of control if they belong to the upper 50% of the scale which is the case. Despite this, it was also observed that the entrepreneurs have a high need for achievement and a medium/high-risk propensity when comparing with the max and minimum of the scale.

The results also show that entrepreneurs have high levels of resilience, as well entrepreneurial passion. These findings are consistent with Cardon, Glauser, & Murnieks (2017) since they consider that entrepreneurial passion contributes to innovate and achieve success. Also, the experts consulted in the first part of this study have highlighted those characteristics:

> *It has needed a good promotor. The factor 'luck' it is always important, but luck gives much work. Most of all, we are talking about soft skills; persistence, capacity to risk, capacity to share their own idea and to test it before starting. Some humility to know how to learn with other, negotiation and communication skills. José Fontes*

> *If we are going to see the success cases, the ones that could get more financial capital, how they precisely got the first 12 months invested. It was not consequence of the award itself, but yes, the promotor's capacity to raise another investor and take it to the next phase. Walter Palma*

The high need for achievement it is one of the most important traits when talking about entrepreneurs and start-up's performance (Collins et al., 2004; Kessler, 2007; Lee & Tsang, 2001). The results follow the literature review since all founders had a high level of need for achievement. About the locus of control, the trait is common to all founders which is consistent with the literature (Kessler, 2007; Lee & Tsang, 2001). Moreover, this type of entrepreneurs is willing to take more risks according to several authors (Boone et al., 1996; Wijbenga & van Witteloostuijn, 2007). Resilience is also considered relevant for start-up growth (Ayala & Manzano, 2014) and entrepreneurial passion it's important to get the necessary investment (Cardon et al., 2009). The results go in line with this since the need for achievement, resilience and entrepreneurial passion are key traits.

According to Bouchard & Loehlin (2001), nearly all personality traits show moderate genetic influence. Nevertheless, personality traits are not immune from experience. In this case, behavioural genetic studies have concluded that individual differences in temperament, measured even during the first few years of life, are only partially heritable and are influenced by environmental experiences (Emde & Hewitt, 2001). In this case, the participation in BGI competition could be considered a trigger in the development or predominance of specific personality characteristics. In this respect, all founders agreed that the experience had a positive effect on personal development. Moreover, when questioned, founders stated that BGI contributed to improve networking/social skills, communication and negotiation skills.

> *Communication and presentation were one of the things with the most value that I got from this participation. Our first presentation was really bad and the last one really good, and that is why we won. And in fact, I learned it there. Movvo*

> *The social skills were the personal trait that I develop the most. My profile did not adapt to it. Public presentations, I hated it. I rather do 10 exams, than one presentation. But now I do pitchs and presentations everywhere, and it goes well. Also, we did not know how to deal with investors since we are from the criative area. How to talk with them, and how to integrate into their world was something we learned there. Musikki*

> *We ended up learning how to do pitchs. I did not like to speak in public, but we had to. It does not get easier, but we learned with it. Nu-Rise*

The dimension **founders experience** intends to reflect founder's prior business experience and determine its relevance to achieve start-up success. Although the literature suggests that prior experience has a positive effect on start-ups performance, it is not a consensual perspective. It is also relevant to understand the differences related to prior-experience since business or research backgrounds could have a diverse effect on founder's positioning.

Considering the sample, only two founders had prior experience in running a business (see Table 17). Nevertheless, the businesses that both launched had different characteristics when compared with

start-ups, mainly because those were promoted in a different market sector where levels of uncertainty and risk were quite different.

Table 17- Entrepreneurs Experience

	Previous business experience	R&D experience	Marketing experience	Commercial experience	Management experience
Movvo	No	Yes	No	No	No
Musikki	Yes	Yes	No	No	Yes
Veniam	No	Yes	No	No	No
Nu-rise	No	Yes	No	No	No
Fibersails	Yes	No	No	No	No

Although Musikki and Fibersails founders considered prior experience as important to address some business challenges, they agreed that it was not enough to understand how to run a start-up.

> *"In business terms, the shop did not have any value, we did not win money with it, but we also didn't lose it. But it was a confirmation that it's possible to have an idea and take it to the end as long as you try it, and it is possible to manage a team and motivate others." Musikki*

> *There's several things that we aren't ready for, or that our degree doesn't make us ready, even though I have a management and IT background, and having created a company previous to this project. Fibersails*

The founders of Movvo and Nu-Rise did not possess prior business experience, but they were involved in several multidisciplinary projects, which allowed them to gain knowledge and competencies to manage differences between team elements.

> *We were really experienced in developing the technology, in prototype phase; but we had zero knowledge about commercial strategies and business development" Movvo*

Veniam stands differently since the founder's team included two persons with a solid business background and experience in implementing new technological businesses. When compared to the other cases, this team was more experienced, more knowledgeable and more prepared to start and run the start-up. Also, the prior experience was determinant to pursue the milestones imposed by the BGI and leverage the start-up more autonomously.

In general, all the founders had prior experience in academic projects. The influence of this type of experience - the R&D experience – is controversial in the literature. On the one hand, Chorev & Anderson (2006) argue that this type of experience is essential for the development of a start-up. The results suggest that this kind of experience was important for the developing of the product and technology, but was not so relevant regarding the competition. Also, it is possible to recognise that those who previously had a business were more aware of the difficulties in running a business. On the other hand, the experience of running a traditional business was not sufficient to provide management and/or marketing knowledge to overcome all challenges a start-up may face. The literature supports the data since the experience in creating a company before isn't considered significant to the start-up success (Song et al., 2008).

The marketing experience can be critical to the success of the start-up (Song et al., 2008), but only if the entrepreneurs know how to adapt the marketing strategies to their type of products/services (Silva, 2016). In this study, none of the interviewed had any marketing experience. The commercial experience is quite important because it can affect the sales negatively (Silva, 2013). The results suggest that BGI helped, in a general way, all founders to improve these personal competence through training and mentoring. Last, the management experience it is also considered relevant to the start-up success (Lee & Tsang, 2001) which is only confirmed in Musikki case.

> *We learned a lot in the training and the mentoring. Because of our technological background, almost all the business knowledge was acquired in the BGI. Movvo*

The findings concerning founders related factors suggest that resilience and entrepreneurial passion are key personality traits to achieve start-up success. Also, the findings reveal that BGI had a positive impact on personal characteristics since allowed founders to learn and reinforce several competencies. Moreover, all founders agreed that being involved in BGI was quite relevant to leverage their experience and knowledge related to business since they were exposed to training, mentoring and field work, which helped them gain experience in areas where they still hadn't work.

In sum, the BGI experience enabled all founders to increase the ability to run start-ups more successfully mainly due to the business experience and personal development.

STRATEGY RELATED FACTORS

The **strategy** is one of the most important factors to start-up's success, and it needs to be fully defined and developed so that the performance it is not affected negatively (Dess & Davis, 1984; Porter, 1980). The development of a business plan can help entrepreneurs to assess the potential of their business idea, through gathering and reflecting on relevant market data. Thus, it is considered that founders that use the business plan increase the probability of the start-up success (Hyder & Lussier, 2015; D. Silva, 2016) but typically the entrepreneurs don't give the right importance or simply don't know how to do one (Hyder & Lussier, 2015; F. Silva, 2013).

After comparing start-ups business model before and after the BGI competition, it is possible to state that all start-ups have changed some aspects of the initial business model, such as the market strategy. Additionally, the training and mentorship provided by BGI was relevant to help entrepreneurs to develop business plan during three months. The following statements expose the importance of mentorship in business plan development:

> *"We learned a lot in the first boot camp, and after that, we had to make small deliverables in a short time if I recall. It was an intense week that helped us to develop a pretty good business plan" Movvo*

> *"Was after the first boot camp that we started thinking about the business plan that we had to develop. Since the summer to the end of the year, we were always working on it, it was a section per week." Veniam*

> "*It was assigned to us a mentor, and during a period of 3 months, we were developing the business plan. We had one week to do a task, and at the end of that week we had a meeting with the mentor where he corrected, and gave us suggestions and then we had to adapt it." Nu-Rise*

Before the competition, all founders recognised the importance of the business plan but only Luís Moutinho from Nu-Rise knew how to do it due to prior experience in another competition (see Table 18).

Table 18 - Business Plan importance and know-how

	Knew the importance	Knew how to do it
Movvo	No	No
Musikki	Yes	No
Veniam	Yes	No
Nu-rise	Yes	Yes
Fibersails	Yes	No

For instance, Roberto Ugo (Movvo) only understood the importance of developing a good business plan during the competition and Susana Sargento (Veniam) considered the business plan crucial to develop business thinking.

Summarising, the results suggest that BGI had a positive impact on business plan' development mainly through mentoring and training. All founders reinforce literature since they considered business plans critical to the start-up success (Hyder & Lussier, 2015; D. Silva, 2016).

RESOURCES RELATED FACTORS

The **financial capital** is an important resource to the start-up development and success (Hyder & Lussier, 2015; Song et al., 2008). However, the financial capital is dependent on the investor's interest in and their will to assume the risk.

With the exception of Veniam, all the four cases were not able to get any funding before BGI. Also, Veniam was born from an idea developed under a funded project, inside the university.

Nevertheless, BGI was for all cases, a landmark to achieve financial capital, directly or indirectly. Although none of the investments on the different start-ups resulted from the demo-day (where entrepreneurs pitched their businesses to investors). BGI has facilitated the access to national and international networks that otherwise would be closed and difficult to reach. Moreover, the linkage BGI-MIT was determinant to provide more credibility and awareness of the start-ups.

> *"Winning the first edition of the BGI Influenced the interest of the investors; We were able to raise funding from the USA because of the IMT stamp" Movvo*

> *"Obviously that it was also our work to convince that investors but yes, the trust that they have in the institution (MIT) and in the people behind was important" Musikki*

> *"The BGI was that first step where they verified that we were not kidding, and we are doing something that could have a great impact. That was when they start given us value" Veniam*

As evidenced in Table 19, before being enrolled on BGI, Veniam (as a research team and not as a company) was able to access financing from research projects, and Fibersails starts with founder's capital.

Table 19 - Financial Capital before and after BGI

	Before the BGI	After the BGI
Movvo	Nothing;first round of financing was the BGI's prize	2 Angel Investments (USA and Portugal); Venture Capitals (Sonae IM);
Musikki	Nothing; first financing round was the BGI's prize	Three rounds: One with Intercapital; Other with Smart Equity from Accenture and another with Portugal Ventures. They could gather 1,5M€
Veniam	Financing from investigation projects: Carnegie Mellon; Portuguese Foundation for Science and Technology	Business Angel; Venture Capitals (Serie A and Serie B)
Nu-rise	Nothing; first round of financing was the BGI's prize	Portugal 2020
Fibersails	Founders;	Business Angels; VC (two rounds)

Usually, entrepreneurs need financial capital to start their business, which can be difficult to reach (Kessler, 2007; Song et al., 2008). Winning the final prize of the BGI has allowed all teams to have conditions to proceed. Also, the visibility and reputation obtain help them to reach investors.

Summarizing, the results suggest that the participation at BGI had a positive effect on capturing financial capital reinforcing the opinion of several authors (Hyder & Lussier, 2015; Song et al., 2008). In one hand, all start-ups had access to the prize money, and on another hand, they were exposed to potential investors. Both situations contributed to access financial capital.

Intellectual property is commonly considered as an important asset to ensure competitive advantage but "*the costs may seem prohibitive to an early stage technology start-up*" (Wilton, 2011). Especially in technology sectors companies tend to use patent protection as a defensive strategy.

Considering the sample, all start-ups had already filed patent requests before the competition, with the exception of Musikki. To Movvo, Veniam, Nu-Rise and Fibersails intellectual property was considered vital to ensure a competitive market position.

Musikki followed a different strategy when compared to other 4 cases. The founders decided not to proceed with patenting since they considered the technology developed "*too obvious*". Thus, the patenting process is often too long and following such IP strategy could compromise the advantage of entering the market first. Nevertheless, the differences between the industries, growth rates and market value could have influenced such decision. Despite this, Musikki won the first prize of BGI even without any technology protection.

The participation on BGI competition, the access to the first prize and venture capitals allow start-ups to gather financial resources to proceed with patent strategy and/or develop the proof of

concept. According to the literature the patent protection it is considered important for the success of the start-ups (Song et al., 2008) since it can, for example, reduce the risk of the company in the eyes of the investors (Bader, 2008).

In general, the patent protection was, with Musikki exception, an important factor to achieve success, since it contributes to access financial capital.

Professional advisors are seen as experienced people on the field with a solid background and a larger network prepared to help start-ups growing and scaling according to Hyder & Lussier (2015) and Lussier & Corman (1996).

Knowing that experts and mentors network are vital to help start-ups, BGI possesses a team of professional advisors, at national and international levels. Due to the BGI acceleration program, founders were able to work closely with professional advisors at different development phases. During the process, all founders had regular contact with, at least, one professional advisor. Nevertheless, a larger network of experts was available.

All founders agreed that the presence of professional advisors was beneficial to design the strategy, develop the business plan and explore the business model during BGI as stated below.

> *We had a dedicated mentor during all process that took our doubts, and then we had the ones that gave us the workshops and conferences. In some way, the mentor was proactive, not only defining the business strategy but also contacting clients. Movvo*

> *Yes, we are still in today. The network remained. In this case, it was only one, that had the principal role, and that was very important because in a way it helped us shape the idea. In our case it made a difference because we had, sometimes, an approach and because he was already on the market, it helped build a bit the business model, and that made much difference, so we kept in touch. Nu-Rise*

> *We still have regular contact with the BGI and with the BGI's mentors. FiberSails*

During BGI, Veniam was more autonomous since the founders already knew some professional advisors. Yet, in their opinion, the competition was crucial to increase knowledge, gather experience and access different resources.

In a general manner, Hyder & Lussier (2015) and Lussier & Corman (1996) arguments were confirmed since all start-ups agreed that professional advisors were relevant to foster start-ups growth and, more importantly, to define their business models. The results also show that professional advisors can help the start-up to gain initial resources such as the network of financial capital, which normally are difficult to reach in early stages, inducing the success of the start-up (Lussier & Corman, 1996).

The existing literature states **team background** diversity as critical for start-up success (Chorev & Anderson, 2006). Departing from the analysis of the five cases, only two founders - Fibersails and

Veniam - had a diverse background (see Table 20). The other three cases are quite similar since the founders come from the academic environment, mainly technological, and from the same knowledge areas.

Table 20 - Team background

	Number of founders	Background
Movvo	3	Network engineering and computer systems
Musikki	3	Communication and multimedia
Veniam	4	Engineering and Management / Transportation
Nu-rise	3	Biomedical engineering / Physics
Fibersails	2	Computing and management / Sailing Sport

Fibersails was founded by two entrepreneurs, with different backgrounds, which allowed them to assume different roles. Veniam appears as a different case since the founder's team was composed by four elements, with different backgrounds and prior-experience. Susana Sargento and João Barros were academics with a solid experience in research and international projects, but without any experience related to start-ups. The other two founders, Roy Russel and Robin Chase, had already experience on the creation of a tech start-up.

Although the literature points the diversity of the team as key to business development, as seen on table 20, namely on technological start-ups it is usual that founders come from similar environments. Probably this is related to knowledge needs under technological development. Also, and considering the cases, most of the teams emerged from research projects. Commonly, this type of projects integrates people with similar backgrounds, especially in technological domains.

The BGI competition contributed to suppress knowledge gaps in all teams. It is also mentioned that when the founders lack some expertise the professional advisors can help to overcome this (Chorev & Anderson, 2006). They were all consensual about the importance of having training and mentoring to help them to address start-up challenges. Although they all recognised some difficulties to capture management, business and marketing concepts, the BGI contributed to increase the team knowledge and enhance the start-up success.

In fact, some investors are more focused on detecting serial entrepreneurs rather good ideas. This position is confirmed by Nu-Rise and Fibersails.

> "*The investors invest in the team; of course, the idea matters, but a lot of the times they have to see if the person can adjust if something different than expected happens." Nu-Rise*

> *"If it's a good team and the project can't have success in that area, the team has the know-how and capacities to see what the market needs and adjust." Fibersails*

According to Chorev & Anderson (2006), in a team it is also important to consider team commitment. The results suggest that BGI was, for all of the cases, a way to gather the necessary resources to proceed with the business idea allowing more commitment.

> "*I do not think we would have started. The goal was not to move forward; we saw that it had an application but... Was because of the BGI that it all changed" Nu-Rise*

For Musikki founder it was essential to win the prize because it allowed being in full time. Also, Veniam founder stated that being 100% within the start-up was crucial to gather investors interest since they considered the commitment as a risk suppressor.

Summing, the results suggest that BGI competition had a positive effect on team knowledge and expertise. However, there were no differences related to initial founder's team. However, the access to financial capital was crucial to gather new resources, mainly after the competition.

Several authors affirm that **networking** not so important when compared with other success factors (Chorev & Anderson, 2006; Silva, 2013). The results show the opposite since all the founders mentioned that BGI was important to build network, recognition, and good reputation.

> *"None of them had to do with music, and they were not obvious contacts to me, not even of investment; but they know others and bring us validation" Musikki*

> *"There was that important step, the recognition; when we had the reunions with the investors we could say we won this contest, or that we were finalists of a contest that had 134 ventures" Veniam*

BGI allow all founders to access investors and professional advisors. Nevertheless, for Nu-Rise and Fibersails the network was not so valuable when compared with other initiatives promoted outside the competition.

The following table (see Table 21) summarises the network gathered by all start-ups during BGI competition.

Table 21 - Networking gathered through the BGI

	Clients	Suppliers	Investors	Partnerships
Movvo	Yes	No	Yes	No
Musikki	Yes	No	Yes	Yes
Veniam	No	No	No	No
Nu-rise	No	No	No	No
Fibersails	No	No	Yes	No

Summarizing, BGI competition was important to build founders' network, especially regarding investors, which according to the literature can "*sharply decrease the hazard of mortality and increase the likelihood that start-ups obtain external funding*." (Shane & Stuart, 2002, p. 168).

START-UPS SUCCESS

Considering the study goals, and in order to identify the factors that contribute to start-ups success, it was possible to obtain from each founder their position and statement about what they consider as success (see Table 22). The success definition is not consensual between the founders, even though all relate success to milestones. For instance, to Roberto, João and Luís success is when people use their products. For Susana success is the accomplish of every defined goal. On the other hand, Pedro considered success when the start-up makes an exit.

Table 22 – Success definitions

	SUCCESS DEFINITIONS
Movvo	"*Seeing the technology being used in different places, such as South Africa, Panama, and having profits; Conquer markets and clients.*"
Musikki	"*Being used in large scale and make money, or at least create value.*"
Veniam	*"Success is when we can reach our objectives."*
Nu-Rise	*"Seeing the product being used, not the money; when we notice that people are using what we do, it ends up being a plus."*
Fibersails	"*Success it is only measure in the end and the objective of a start-up it is to make an exit through an acquisition or a stock exchange entry.*"

Departing from success definition, the results also highlighted the factors considered more relevant (influence by BGI competition) for the founders to achieve start-up success.

For Roberto Ugo (Movvo): "*The money was nice, but the recognition was even better. Also, the networking was important*".

João Afonso (Misikki) considered that "*networking was a major benefit*" and also "*the link between BGI-MIT since it opens the opportunity to reach people that would be impossible*".

Susana Sargento (Veniam) also said that the national recognition was one of the most important things in the BGI.

For Luís Moutinho (Nu-Rise) and Pedro Pinto (Fibersails) the mentorship and networking were the most relevant factors concerning the start-up success.

CROSS RESULTS ANALYSIS

The cross analysis was performed through thematic analyses using NVivo software. The proposed model encompassed nine categories, and this analysis enables us to understand what each interviewed as considered more relevant. Figure 7 displays a summary of the nodes and references obtained through the analysis of each category. As observed, Musikki and Veniam have the higher number of references when compared to the other cases.

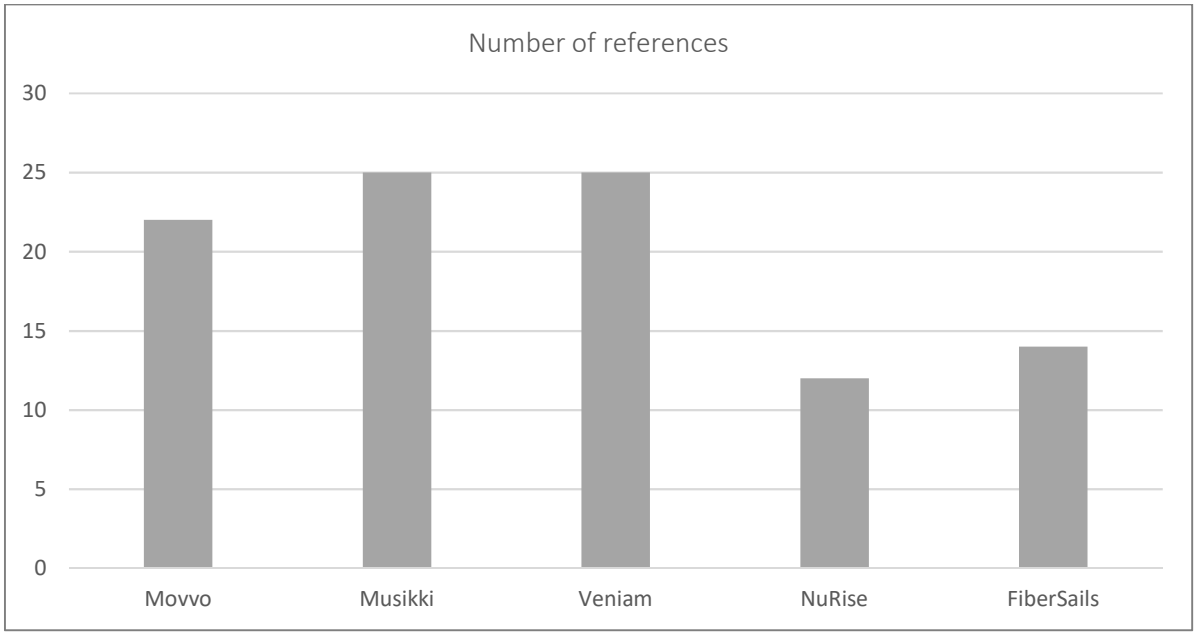

Figure 7 – Number of references

The Figure 8 shows the number of references along the different sub-categories. From the eight sub-categories initially considered, 'start-up resources: financing Capital' captured the highest number of references and 'Start-up resources: patent protection' was the sub-category with less references. Also, during the analysis, a new sub-category related to start-up strategy was detected: entrepreneurial ingenious'. In this case, it is highlighted the intense efforts of entrepreneurs in gathering all possible resources, through different sources, to leverage the success of their business. The new sub-category 'start-up strategy: entrepreneurial ingenious' overlaps to all sub-categories assuming a dominant position. The definition of each sub-category is described in annexe 1.

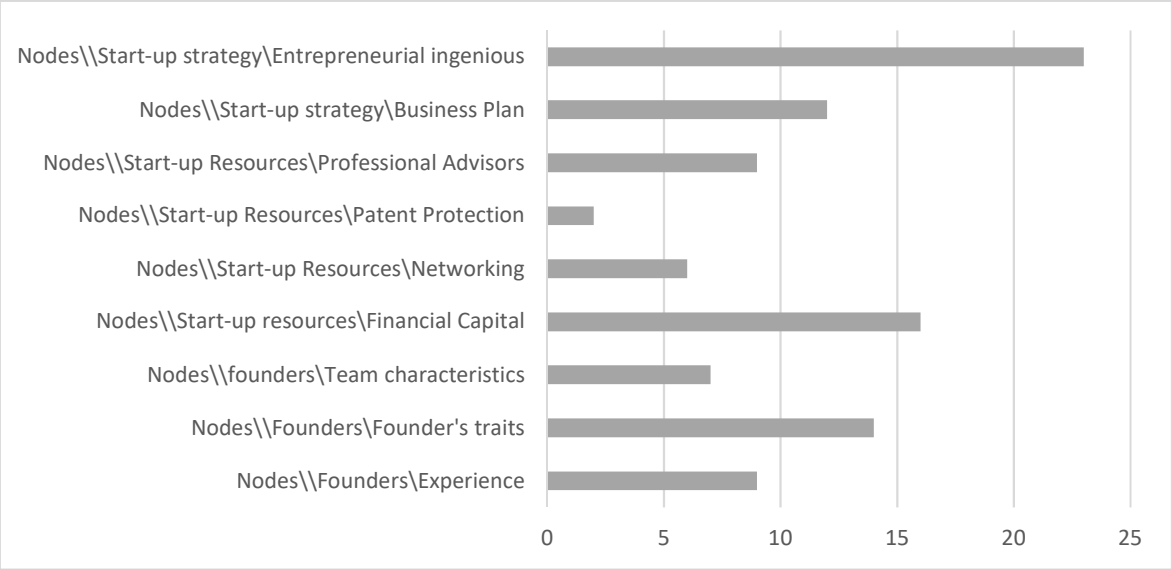

Figure 8 – Frequency of sub-categories

In terms of position (relevance of sub categories considering the number of references related to each of them) the 'start-up strategy: entrepreneurial ingenious' assume the first place with 23 references (see Table 23). In this case, in all interviews, the founders have mentioned that they were always looking for opportunities to raise money and resources for their start-ups. That was the main reason why all of the companies had to participate in several entrepreneurship competitions.

In the second position is 'start-up resources: financial capital'. Following this, 'founder's traits' and 'start-up strategy: business plan' takes the third and fourth position, respectively. With less than ten references, founders experience, team characteristics, start-ups resources: networking and start-up strategy: professional advisors assume the fifth, sixth, seventh and eight positions. Finally, the last position is related to 'start-up resources: patent protection'. This analysis shows that every sub-category was verified within the case studies and provides a ranking about the sub-categories.

Table 23 – Success Factors Positioning

Categories	Sources	References	Position
Founders Traits	5	14	3
Founders Experience	5	9	5
Team characteristics	4	7	6
Start-up resources: Financial Capital	5	16	2
Start-up resources: Networking	4	6	7
Start-up resources: Patent Protection	2	2	8
Start-up resources: Professional Advisors	4	9	5
Start-up Strategy: Business Plan	5	12	4
Start-up Strategy: ingenious	4	23	1

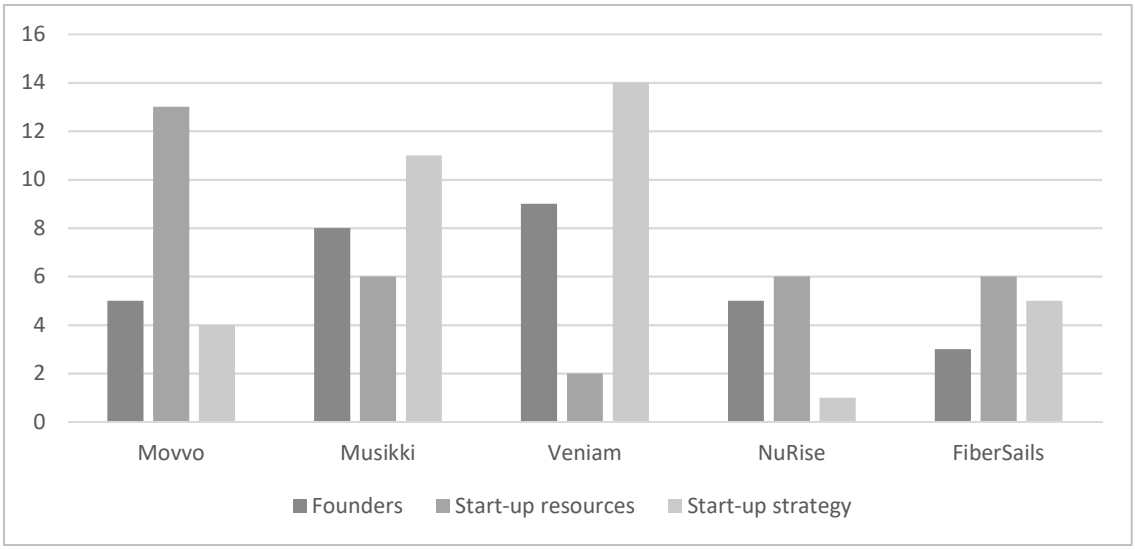

Figure 9 - Frequency of main categories

From the results obtained, the relevance of the different dimensions was different for each of the case studies. In the case of Musikki and Veniam the most relevant dimension was ‘start-strategy’, and regarding Mowo, NuRise and FiberSails was ‘start-up resources’.

6. CONCLUSION

This present research aims to provide a deeper understanding of the factors that underpin the start-ups success. Departing from the question **""How does start-up competitions influence the success of start-ups?"** several dimensions were explored in order to find the most relevant factors to start-ups success.

Initially, in the literature review, it was identified nine factors divided into three groups: Founders (personality traits; experience); Start-up strategy (business model; business plan); Start-up resources (financial capital; networking; team; professional advisors; patent protection). Results from interview BGI participants reveal that the participation in this competition had impact on the following factors: financial capital, business plan and founders' traits. One of the findings is that 'entrepreneurial ingenious' arises as a new dimension, with a strong positioning concerning start-up success. In this case, all participants had a shared practice of always searching and taking advantage of opportunities, such as participating in several entrepreneurial competitions.

Regarding the financial capital, the BGI competition influences the access to investors positively and has impacted start-ups' reputation and visibility. As a consequence, this enhances the possibility to gather financial resources and professional advising. Concerning the business plan, the impact of BGI competition was notable. The main focus of the program was about writing a good and solid business plan, which according to the literature it is essential to the start-up's success. Also, the development of the founders' personality traits during the BGI, specifically soft skills such as networking skills, communication and negotiation skills, were crucial to entrepreneurs develop their start-up. The professional advisors, namely the mentors, were considered by all the interviewed really important in this process.

Regarding other variables, the participation in BGI had a minor influence. Despite this, one should be aware that all factors may be interconnected, e.g., the professional advisors influence the networking and the financial capital; the development of the business plan consequently influence the strategy of the start-up and their business model. The financial capital influenced the access to other resources, such as the patent protection. Moreover, also, the personal traits of the entrepreneur influenced all the other variables, since it is the founder that takes all the decisions.

Regarding the research question, the main finding of the present study is that start-up competitions influence the considered success factors positively. Nevertheless, factors such - financial capital, business plan, founders' traits, and professional advisors – can be considered more relevant when compared to the others - experience; business model; networking; patent protection. These conclusions could provide valuable insights into what should be the key feature of an impactful entrepreneurship competition.

Despite the contributions made, the present work presents some limitations. The first limitation is related to the size of the sample. This was an exploratory study, and in the future, the study could be extended to all start-ups enrolled in BGI competition, and a comparative approach between winners and no-winners could be made.

Another limitation is related to the measurement of personality traits since it was not possible to implement the questionnaire before and after the competition. So it was difficult to take conclusions regarding the impact of BGI participation. In future work, it is suggested to perform a pre-test and post-test to compare results and obtain the differences between personality traits.

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ANNEXS

ANNEX 1

Categories	Definition
Founders Traits	Involves the age and education of the founders and personality traits: need for achievement, risk propensity, locus of control, entrepreneurial passion and resilience.
Founders Experience	Experience of the founders in different areas such as R&D, Marketing; Management; Commercial. Also, experience of the founders in the sector and experience in creating their own company either in the sector or not.
Team characteristics	Related with the entrepreneurial team. Involves characteristics such as the background and diversity of the team.
Start-up resources: Financial Capital	The financial capital that the founders could gather, either by business angels, venture capitals, or other forms of financing, by influence of the BGI.
Start-up resources: Networking	The network that the founders built in the BGI. Either network of clients; suppliers; investors; advisors/experts and partnerships.
Start-up resources: Patent Protection	The existence or not of patent protection, and how the BGI influenced it.
Start-up resources: Professional Advisors	Involves the influence that the mentors and formation in the BGI had in the development of the start-up.
Start-up Strategy: Business Plan	The development of the business plan and how the BGI influenced it.
Start-up Strategy: ingenious	The ability of the founders to gather all the resources available and seize all the opportunities available.

ANNEX 2 – INTERVIEW SCRIPT

1. What was the source of the primary idea? How did it come to life?
2. Can you describe the experience of participation in the BGI?
3. Why did you choose to enrol in the BGI?
4. What was the award received?
5. Did you participate in another idea contests? If so, which ones? What awards did you received?
6. What is the importance that the business plan had in the implementation of the company? And how does it still affect the development of the start-up? In what way was the business plan important for the participation in the contest?
7. BGI had some impact in the growth of the networking of:
    a. Potential Clients
    b. Potential Suppliers
    c. Potential Investors
    d. Advisors/experts
    e. Partnerships
8. Financial capital:

Type	Yes/No	At what time
Business Angels		
Venture Capitals		
Friends, Family, and Fools.		
Other ways of financing		

9. Entrepreneurial team:
    a. Expertise/Background
    b. Knowledge diversity
10. Experience:
    a. In the sector, but without own business
    b. In another sector with own business
    c. Another sector but without own business
11. In what way did the media coverage influenced the visibility/reputation of the start-up?
12. How do you see/perceive success? Define it.
13. Did this participation meet your expectations? What was the factor that the participation in this contest influenced the most?
14. Would have changed it anything if you did not have participated in the BGI?

ANNEX 3 –PERSONALITY TRAIT'S QUESTIONNAIRE

Need for Achievement (Rego, 2000)

1. If I have a choice, I like to choose tasks which results I can be held responsible.
2. I feel attracted by new tasks.
3. If I feel difficulties in a new task that was attributed to me, I look for help of experts in the matter.
4. I like to constantly improve my personal competences.
5. I strive to improve my past performance
6. I like to know if my job was well done or not, so that I can improve in the future.
7. At work, I try to do better every day.
8. I try to do my job in an innovative way.
9. I try to avoid being given more responsibility. (Inverted scores)
10. When the difficulties are bigger, I tend to give up looking for what I wanted. (Inverted scores)

Risk propensity (Hung & Tangpong, 2010)

1. I believe that higher risks are worth taking for higher rewards.
2. To me, the best possible plan is the plan that is risk-free. (reverse coding)
3. I like to take chances, although I may fail.
4. Although a new thing has a high promise of reward, I do not want to be the first one who tries it. I would rather wait until it has been tested and proven before I try it (reverse coding)
5. When I have to make a decision for which the consequence is not clear, I like to go with the safer option although it may yield limited rewards (reverse coding)
6. I like to try new things, knowing well that some of them will disappoint me.
7. To earn greater rewards, I am willing to take higher risks.
8. I prefer a tested-and-tried approach over a new approach, although the new approach has some possibility of being a better one in the end. (reverse coding)
9. I like to implement a plan only if it is very certain that the plan will work. (reverse coding)
10. I seek new experiences even if their outcomes may be risky.

Locus of Control (Mueller & Thomas, 2001)

1. My success depends on whether I am lucky enough to be in the right place at the right time
2. To a great extent my life is controlled by accidental happenings.
3. When I get what I want, it is usually because I am lucky
4. My life is determined by my own actions.
5. When I get what I want, it is usually because I worked hard for it.
6. It is not wise for me to plan too far ahead, because things turn out to be a matter of bad fortune.
7. Whether or not I am successful in life depends mostly on my ability.
8. I feel that what happens in my life is mostly determined by people in powerful positions.
9. I feel in control of my life
10. Success in business is mostly a matter of luck.

Entrepreneurial Passion (Cardon et al., 2013)

1. It is exciting to figure out new ways to solve unmet market needs that can be commercialized.
2. Searching for new ideas for products/services to offer is enjoyable to me.

3. I am motivated to figure out how to make existing products/services better
4. Scanning the environment for new opportunities really excites me.
5. Inventing new solutions to problems is an important part of who I am.
6. Establishing a new company excites me
7. Owning my own company energizes me
8. Nurturing a new business through its emerging success is enjoyable.
9. Being the founder of a business is an important part of who I am
10. I really like finding the right people to market my product/service to.
11. Assembling the right people to work for my business is exciting
12. Pushing my employees and myself to make our company better motivates me
13. Nurturing and growing companies is an important part of who I am.

Resilience (Connor & Davidson, 2013)

1. I am able to adapt when changes occur.
2. I have at least one close and secure relationship that helps me when I am stressed.
3. When there are no clear solutions to my problems, sometimes fate or God can help.
4. I can deal with whatever comes my way.
5. Past successes give me confidence in dealing with new challenges and difficulties.
6. I try to see the humorous side of things when I am faced with problems
7. Having to cope with stress can make me stronger.
8. I tend to bounce back after illness, injury, or other hardships.
9. Good or bad, I believe that most things happen for a reason.
10. I give my best effort no matter what the outcome may be.
11. I believe I can achieve my goals, even if there are obstacles
12. Even when things look hopeless, I don't give up
13. During times of stress/crisis, I know where to turn for help.
14. Under pressure, I stay focused and think clearly
15. I prefer to take the lead in solving problems rather than letting others make all the decisions.
16. I am not easily discouraged by failure.
17. I think of myself as a strong person when dealing with life's challenges and difficulties
18. I can make unpopular or difficult decisions that affect other people, if it is necessary
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.
20. In dealing with life's problems, sometimes you have to act on a hunch without knowing why.
21. I have a strong sense of purpose in life.
22. I feel in control of my life.
23. I like challenges.
24. I work to attain my goals no matter what roadblocks I encounter along the way.
25. I take pride in my achievements